



AGRICULTURAL RESEARCH INSTITUTE
PUSA

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS

OF THE

ENTOMOLOGICAL SECTION

OF THE

ACADEMY OF NATURAL SCIENCES

OF

PHILADELPHIA.

VOLUME XXIV, 1913.

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PHILADELPHIA:
ENTOMOLOGICAL ROOMS OF
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

1913.

The several numbers of the NEWS for 1913 were mailed at the Philadelphia Post Office as follows :

January	December 31, 1912
February	January 31, 1913
March	February 28, 1913
April	March 31, 1913
May	April 30, 1913
June	May 29, 1913
July	June 30, 1913
October	September 30, 1913
November	October 31, 1913

The date of mailing the December, 1913, number will be announced in the issue for January, 1914.

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J. R. Peck

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXIV.

JANUARY, 1913.

No. 1.

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Titian Ramsey Peale.

(Portrait, Plate I)

Following our practice of the last two years in placing a portrait of one of the older American entomologists on the cover of the NEWS, we have selected for the frontispiece and for the cover for 1913 the portrait of Titian Ramsey Peale.

Titian R. Peale published in 1833 a work entitled *Lepidoptera Americana** which seems never to have passed beyond a single small installment.

**Lepidoptera Americana*: or, Original Figures of the Moths and Butterflies of North America; in their various stages of existence and the plants on which they feed. Drawn on stone, and coloured from nature; with their characters, synonyms, and remarks on their habits and manners. By Titian R. Peale. Curator of the Philadelphia Museum. Vol. I. No. 1, Philadelphia: Printed by William P. Gibbons, S. W. corner Sixth & Cherry Sts., 1833.

The copy of Number 1 in the library of the Academy of Natural Sciences of Philadelphia comprises 14 unnumbered pages of text and 4 colored plates numbered 3 to 7; the size is $8\frac{3}{4} \times 10\frac{1}{2}$ inches. Accompanying this single part is a printed sheet of "The Proposals for Publishing by subscription a work to be entitled *Lepidoptera Americana*" which state that "the work will consist of one hundred Plates," in Numbers of four Plates, to be regularly published every two months, at Ten Dollars a year; a few other uncolored plates with Peale's autograph and the date 1836, and some unpublished manuscripts.

He was chiefly known, however, as an illustrator of books in various branches of natural history, such as Thomas Say's *American Entomology* (1824-28), a number of the plates of which bear his name. It is possible that it was to Peale that Say referred in his letter to J. F. Melsheimer, dated from Philadelphia, July 30, 1816, and published by Mr. W. J. Fox in the *News*, volume XII, page 140 (1901), as follows: "On the lid of the box within you will find two plates of insects intended for my *American Entomology* they are all to be coloured—I send you the plate of *G. Tityus* as the first one that I have had coloured you will not criticise it with too much severity as the artist is young & will improve." This plate is No. 4 of the first volume of Say's work and is unsigned. Peale, at the time of the writing of this letter was about sixteen years of age.

Peale's association with Say is shown by passages in two others of the latter's letters to Melsheimer. In that of June 10, 1818 (*Ent. News*, XII, p. 234), Peale is mentioned as one of the party who accompanied Say on his collecting trip to Florida, while that dated March 13, 1819 (*l. c.*, p. 281) reads. "Mr. T. Peale will accompany me [on Major Long's Western Expedition to the Rocky Mountains] to prepare the skins of such animals as may be discovered." Occasionally in the *American Entomology*, Say quotes observations by Peale.

Peale's collection of Lepidoptera is still preserved at the Academy of Natural Sciences of Philadelphia, partly in his original boxes in the form of books measuring $9\frac{1}{2} \times 11\frac{3}{4} \times 2$ inches. Under each of the two covers of each book is an inner cover of glass, to the inner surface of one of which are fastened small disks of cork, a specimen being pinned in each disk. The distance between the glass covers is about $1\frac{1}{4}$ inches and the enclosed space is tightly sealed, but both surfaces of each specimen can be clearly seen. One of these boxes contains the type of Say's *Hipparchia* [= *Chionobas*] *semidea* with a record to the effect that it is the original of the plate in the *American Entomology*. This record has been quoted in the *News*, volume XIII, page 12 (1902).

Appleton's *Cyclopedia of American Biography*, volume IV, New York, 1888, contains a brief sketch of Titian Ramsey Peale, stating that he was born in Philadelphia in 1800 and died in the same city, March 13, 1885. He was the son of Charles Willson Peale (1741-1827), artist and portrait painter and founder of Peale's Museum*; Rembrandt Peale (1778-1860), also a well-known portrait painter, and Raphaele Peale (1744-1825) were brothers of Titian R. Titian R. accompanied the United States Exploring Expedition under Lieutenant Wilkes in 1838-1842, and was an Examiner in the Patent Office at Washington from 1849 to 1872.

New Species of Heterocera from Brazil (Lepid.)

By W. SCHAUS, London, England.

Ormiscodes hortensia sp. n.

♂. Head and collar dark brown. Thorax olive brown mottled with light brown hairs. Abdomen brown red banded with black.

Fore wings greyish buff mottled with olive brown scales, and with some irregular fine fuscous horizontal streaks; an indistinct darker subterminal shade, expanding on costa into a better marked fuscous brown shade; a large triangular space medially on costa, dark olive brown mottled with pale hairs, edged by a fuscous line inwardly oblique from costa to below cell, rounded and vertical to costa, slightly lunular outwardly and enclosing a fuscous streak on discocellular.

Hind wings bright brown on base and inner margin, shading to darker brown outwardly and towards costa; a dark discal spot; a fuscous brown postmedial line; a broad subterminal fuscous shade; termen coloured like fore wings.

Ex. 85 mm.

Hab. Piassaguera, São Paulo.

*Peale's Museum, a private enterprise, was also known as The Philadelphia Museum and was an entirely distinct institution from the Academy of Natural Sciences. Most of its contents were destroyed by fire or scattered among various owners after a somewhat checkered existence.

Dirphia picturata sp. n.

♂. Head, collar, and thorax dark brown. Abdomen brownish black dotted with white; basal segment bright red; fine reddish brown segmental lines, anal hairs yellow brown.

Fore wings: a dark brown oblique shade at base reaching antemedial line on inner margin, the space above it lilacine buff mottled with whitish hairs, limited by the antemedial line, which is fuscous brown, finely pale, edged inwardly, vertical on costa, outcurved and angled in cell, almost vertical below cell, somewhat outbent on inner margin. Wing beyond brown shaded with fuscous brown in cell; an irregular white spot on discocellular, containing a fuscous grey line following its outline, being narrow in front and slightly inbent, somewhat constricted medially, and broader behind; beyond cell on vein 5 are two small white spots with grey centers, almost suffusing; on one wing there are some small dots on vein 6, and one on vein 2 near outer line; this line is fuscous brown, slightly inbent from costa, followed by a pale brown and then a lilacine shade; subterminal fuscous brown spots connected by an indistinct line; from vein 4 to 6 the spots suffuse with the terminal shade which is dark brown, narrowing towards apex and tornus which are filled with the lilacine shade.

Hind wings brown shaded with red at base; hairs on inner margin red; a reddish brown spot on discocellular, pale edged; a fuscous brown postmedial and subterminal shade, the latter followed by a lilacine shade.

Fore wings below grey brown shaded with red on inner margin; a black discal point; an outer lilacine shade, darker edged.

Hind wings below lilacine to just beyond cell; a medial brown shade; a fuscous brown small spot; terminal space brown; a subterminal lilacine shade.

Ex. 62 mm.

Hab. Joinville, Brazil.

Automeris coronis sp. n.

♂. Head and collar dark brown. Thorax brown, shading to reddish brown behind, the patagia tipped with yellow buff. Abdomen roseate brown, with very faint smoky grey transverse lines.

Fore wings brown, darkest at base and beyond outer line; antemedial line remote from base, fine, fuscous outcurved to vein 2, and again to submedian, marked with pale points on veins; medial space paler, tinged with grey, the discal spot very large, light brown marked with two black points on inner edge, four on outer; a vertical brown postmedial shade from costa to line, this latter fine, reddish brown from

apex to middle of inner margin, marked with buff white points on veins; a diffuse fuscous brown subterminal shade outwardly edged with light brown.

Hind wings dull roseate brown at base and along inner margin, brownish on costa; ocellus very large, black, broadly circled with whitish yellow, containing an irregular brown spot with four lines projecting towards outer margin, and an angled white line within it; a postmedial lunular black line followed by a broad maroon shade; outer margin and cilia ochreous buff, with a darker terminal line.

Fore wings below brownish buff, tinged with reddish except on costal and outer margins which are shaded with fuscous; a large black discal spot containing a small white spot; an outer black line, wavy from costa, well before apex to middle of inner margin; traces of subterminal triangular fuscous shades.

Hind wings below brownish buff irrorated with fuscous; a small horizontal whitish discal streak, dark edged; a wavy, irregular post-medial dark line; traces of subterminal shadings as on fore wings.

Ex. 95 mm.

Hab. Joinville, Brazil.

***Othorene corrupta* sp. n.**

♂. Head, collar, and patagia dull purplish slate colour; thorax roseate brown. Abdomen above pale reddish brown.

Fore wings dull purplish slate colour at base, shading to roseate brown terminally, crossed by numerous black striae, but fewer on outer margin; no traces of lines.

Hind wings pale brown, darker shaded on costa; a purplish red shade along inner margin.

Fore wings below roseate brown, the apex striated with black.

Hind wings below yellow buff, shaded with roseate on inner margin.

Ex. 72 mm.

Hab. Joinville, Brazil.

***Cicinnus maera* sp. n.**

♂. Head roseate brown. Collar, thorax, and abdomen pale reddish; anal tufts fuscous brown.

Fore wings to outer line pale reddish shaded with smoky grey before the line, and with a few scattered fuscous scales on postmedial space; a large round buff white spot filling end of cell, finely darker edged, especially on discocellular, which is followed by a slight fuscous grey shade; pale shades between veins 2 and 4 close to median; a fine darker red line from cell spot to inner margin; outer line remote, fine, oblique on costa, angled at vein 8, then thicker, dark

brown and vertical to inner margin, a black shade from angle above vein 8 to termen at apex, shaded above with fuscous grey; termen roseate buff shaded with pale grey, and irrorated with black, forming clusters on veins near outer line; the apex is bluntly produced, the termen somewhat convex between veins 5 and 2.

Hind wings grey shaded with roseate becoming reddish at outer line and on termen, thinly irrorated with dark scales; the outer line dark brown from costa near apex to anal angle, followed by black clusters of scales on veins.

Wings below similar but duller.

Ex. 33 mm.

Hab. Joinville, Brazil.

***Titya fuscicaudata* sp. n.**

♀. Body dull brown; anal tufts fuscous brown.

Fore wings smoky brown, thinly scaled, the lines broad, greyish buff; antemedial inwardly oblique. inbent at submedian; an oblique black spot on discocellular; postmedial inbent, sinuous; subterminal narrower, parallel with postmedial.

Hind wings smoky brown; a broad, slightly darker, medial shade.

Ex. 58 mm.

Hab. Rio Grande do Sul, Brazil.

The types of these species will be placed in the United States National Museum at Washington.

The Genera *Parotermes* and *Hodotermes* (Isoptera).

By T. D. A. COCKERELL, Boulder, Colorado.

At Station 14, in the miocene shales of Florissant, Colorado, my wife found a specimen of *Parotermes fodinae* Scudder, sufficiently well preserved to show practically the entire venation of the anterior wings. Upon comparison, I find that the venation is nearly identical with that of *Hodotermes ochraceus* Burm., as figured by Desneux in *Genera insectorum*, Isoptera, pl. 1, f. 4a. The difference is mainly as follows: *P. fodinae* has the region above the media considerably narrower, so that about the middle of the wing the media is distinctly nearer to the costa than to the upper branch of the cubitus; the media (scapular vein) gives off above in my example of

fodinae three branches in one wing and four in its opposite (in *ochraceus* six) ; below, the media gives off three branches, the first before the origin of the third upper branch, all leaving the media at a much larger angle than the upper branches (*ochraceus* is quite different here, but *Hodotermes mossambicus* has the lower branches of the media practically as in *P. fodinae*). The cubitus forks before the middle of the wing, and its upper branch forks again, exactly as in *H. ochraceus*; the anal also has a fork below and a little beyond the cubital fork, as in *ochraceus*.

The presence of the sub-costal (sub-marginal) vein, which was supposed to separate *Parotermes* from *Hodotermes*, is not diagnostic, this vein being present in true *Hodotermes*. It is *Parotermes*, formerly considered a sub-genus of *Hodotermes*, which has the sub-costa absent or rudimentary. According to the diagrammatic figure of *Hodotermes brunneicornis* given by Redtenbacher and reproduced by Sharp, the media of that insect has no inferior branches, and the cubitus is wholly unlike that of our fossil; but *brunneicornis* really belongs to a different genus, *Stolotermes*. The indications are, then, that *Parotermes* differs little from *Hodotermes*, so that it may be a matter of opinion whether it is really separable. At the present day, *Hodotermes* is represented by five species in Africa, three in Central Asia and three other dubious forms, Asiatic and African. It therefore, in its occurrence at Florissant, affords a case parallel to those of the Nemopterids and Nemestrinids.

Scudder described a large species from the Florissant shales as *Hodotermes* (?) *coloradensis*. It is remarkable not only for its large size, but the unusually long abdominal appendages, and the total absence of the sub-costal vein on all the wings. It is therefore apparently not a true *Hodotermes*. I have a very fine specimen (Florissant, Station 13, *W. P. Cockerell*) which I have referred to Scudder's species, but on re-viewing the subject I can only conclude that it is distinct, since it has the sub-costal vein well developed, and the abdominal

appendages are very small, resembling those figured by Des-neux for *Hodotermes turkestanicus*. My insect is, I believe, a true *Hodotermes* or *Parotermes*, although the structure of the cubital and anal veins, and lower branches of the media, cannot be made out. It may be named as follows:

***Parotermes scudderi* n. sp.**

Hodotermes coloradensis Cockerell, Popular Science Monthly, LXXIV, 1908, p. 118, fig.

Length about $15\frac{1}{2}$ mm.; head oblong, about $4\frac{1}{4}$ mm. long and 3 wide; wings about 22 mm. long; media to costa in middle of anterior wing about 1 mm., thus the space narrow as in *Parotermes*; media of anterior wing with only three branches above, the first arising nearly 9 mm. from base of wing; radius of lower wing with two branches above; antennae, as preserved, appearing brown with white annuli (the sutures), about six joints to a mm. in middle of antenna.

Easily known from the other species of *Parotermes* by its great size.

Collecting and Mounting Micro-Diptera.

Paper II—Mounting.

By E. T. CRESSON, JR., Philadelphia, Pa.

In previous pages of this journal (1) I gave an account of a method of collecting micro-diptera and promised to supplement it with an article on a method of mounting which I use and find most satisfactory for preserving them for study. It is generally the fact that a thorough systematist is a poor technician and *vice versa*. The systematist being more interested in the insect and its relationship than in the method of mounting and its appearance in relation to others in the series or collection, while the technician considers more the appearance and the method of mounting. The method I use and will here try to describe, should appeal to the former on account of the advantages possessed for thorough examination, while the appearance of the mount and its subject should satisfy the latter.

The common practice of gluing the insect to points, which is usually done by Coleopterists and seems most satisfactory for them, should be discouraged for micro-diptera, and this

(1). Vol. xxi., pp. 406-410.

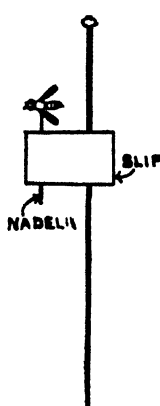
I do most earnestly on account of two very bad features which are evident even when most care is taken in the mounting. This I say in spite of what Prof. C. F. Baker says in his article "On Mounting Minute Insects, Particularly Micro-Diptera," (2) in which he recommends gluing the specimens on cardboard points, arguing mainly from a technician's viewpoint, that the various angles which the specimens may otherwise assume, ruins the appearance of the collection. My objections to this and other methods mentioned in this paper of mine, are based upon experience in handling a great mass of material on all sorts of mounts. Regarding the objectionable features of the method above mentioned, the first and most important is the fact that one surface is always inaccessible for examination, and this surface may have the character of most value. If relaxing and remounting could be done, this factor would not be so objectionable. Then again in mounting with glue the legs which are often tightly folded may have to be spread for examination of the bristles, etc., and this is generally impossible on account of softening the mounting adhesive. Of course, if the adhesive used is soluble in water this factor is eliminated. The other fault in question is that it is often the case when certain characters are to be examined, the large pin interferes with the line of vision. There still remains another fault which can be eliminated and that is the practice of picking the insect up with a moist point or brush in order to place it on the mount. Then again, the moisture from the mounting adhesive will often discolor the insect beyond recognition, thereby rendering the specimen worthless. I have in mind a case where a new species was practically based upon the discoloration caused by the stain resulting from the moisture in the adhesive used in mounting. In handling these small insects, I always use tweezers, picking them up by the wings or, secondly (rarely), by the legs, never, under any circumstances, touching the body with anything other than the point of the mounting pin. As emphasized in

(2). *Psyche*, May 1897, pp. 63-64.

my previous article, an excess of moisture is the greatest enemy one has to guard against in handling these small insects.

Another method which is also used, and although better than the one just discussed, has one of the former objections besides another, not so important, but still a factor to be considered. I refer to the method of mounting the insect the usual way on a minute nadel which is, in turn, stuck into a piece of cork, pith, or similar substance, and this mounted on a standard pin, thus forming what is termed a secondary mount, the method to which Prof. Baker refers as being unsightly. The first objection to this method is the necessity of handling the insect in the act of piercing it with the nadel, although this can be done to some satisfaction by placing the specimen on cloth or pith. The other objection is that the nadel in piercing the thorax will often depress or break the chitin and thereby destroy the normal position of an important bristle or hair.

The method I use also comes under the head of secondary mounting, but overcomes all the objections noted above. This I will try to explain as clearly as possible, and the process, although appearing long and complicated, is quite simple, and the satisfaction gained by having thoroughly practical mounts will offset any extra time spent. This method is practically the impaling of the insect upon the point of a nadel, which



is supported by a cork, pith or blotting paper mount on a standard pin in the manner shown by the accompanying sketch. There are several ways in which this can be done and various kinds of supporting materials used, but I find that blotting paper is the most economical and looks neat. I generally prepare the slips of blotting-paper in quantity, using the thickest blotter I can find (40 pounds to the ream). A standard sheet will supply enough slips for a season's collecting. These slips are cut 5 x 9 millimeters in size, on a photo-trimmer with the aid of a couple of

gauges. The nadeln (I use the American Entomological Co.'s No. 216) are first arranged in a flat bottom tubular vial, whose diameter is less than the length of a nadel, with their points up. This can be done any time, and is to me the most tedious part of the entire proceedings. I throw two or three hundred upon a piece of white cardboard, which at once shows up the pointed ends, and with a pair of fine tweezers I pick each one up and drop it into the vial with its point up. The standard pin is No. 2, steel or hard brass, 39 millimeters long. The foregoing operations are all preparatory and can be done in sufficient quantities to take care of the season's collecting. Preparatory to the actual mounting a goodly number of slips must be pierced through one end by a nadel. Any quantity of these may be prepared, and are best arranged in series, sticking in a sheet of cork or pith. The nadeln are gotten out of the vial by inverting the latter against the thumb of the left hand and pinching a few of the nadeln between the thumb and index finger, and with the forceps each nadel is taken and stuck in a sheet of cork. After a goodly number are thus treated they are then pierced through the slips, and these are arranged as above suggested, thus completing all the operations preparatory to the actual mounting. The following equipment will be found necessary for rapid work; a pair of pinning forceps, a low power ($1\frac{1}{2}$ inch focus) watchmaker's eye lens with spring, a gauge, for making the slips of uniform height on the supporting pin (22 millimeters up from the point), and a sheet of white bristol board or blotting-paper.

The insects to be mounted are thrown, a few at a time, upon the white bristol board, a nadel with its accompanying slip is picked up with the forceps, and, with the aid of the magnifying glass, pierced through the *side* of the thorax, preferably the left side. A click will be heard as the nadel is pulled up, thus indicating that the point has passed through the thorax. Then, with the aid of the other hand, invert the slip and grasp the same with the forceps at the nadel end and pass a standard pin through the other end in the opposite direc-

tion to that of the nadel, but not too close to the end. Reference to the figure will more fully explain this. This finishes the actual mounting and by the use of the gauge, the slip can be run up on the large pin to the given distance, thus making uniform mounts. Finally, by the application of a drop of diluted white shellac at the junction of the slip and the large pin, a very rigid mount is obtained, leaving the nadel free to turn, as is often necessary to present certain aspects for examination. With relaxed specimens, after the same have been dried, a blotter should be used instead of the bristol board so that the point of the nadel can protrude further through the thorax. This will insure a more solid mount, as the body juices are not present to cement the specimen to the pin.

These mounts have a very neat, uniform appearance, and the method, although seemingly rather complicated and lengthy, is very simple, and after a little practice becomes very easy, and one can mount as rapidly as with any other double-mounting method. This method insures as perfect specimens as is possible, and gives access to any surface for examination with a compound microscope, and although it has been used before, I do not see many examples in the collections I have examined. It should be used by all who mount small Diptera, and when one collects by sweeping, the material is often gathered in such large numbers that one needs a rapid and safe method for mounting the same.

Notes on the Phototropism of Certain Mosquitoes (Dipt.).

By HARRY B. WEISS, New Brunswick, N. J.

The different species of mosquitoes exhibit quite dissimilar reactions with regard to their avoidance of and attraction to sunlight. Some are apparently both equally positively and neg-

atively phototropic, while others respond mainly only to one stimulus and again others are unequally positively and negatively phototropic.

Culex pipiens, *Culex aurifer*, *Culex canadensis*, *Culex sylvestris*, *Culex salinarius*, *Anopheles maculipennis* and *Wyeomyia smithii* are negatively phototropic. They appear normally only at night. They are also slightly positively phototropic inasmuch as they are attracted to a certain extent by artificial light and the low intensities found at dusk. In other words these species are positively phototropic up to a certain intensity of light, when they become negatively phototropic.

Near the close of the season impregnated females of *pipiens* becomes strongly negatively phototropic and seek dark hibernation quarters in spite of the warm temperatures, which sometime prevail outside. *Anopheles crucians*, sometimes called the daylight mosquito, is positively phototropic up to the high intensity of light which occurs during the middle of the day. *Anopheles punctipennis* responds both negatively and positively, more so negatively. Its normal attraction is a low intensity.

Culex sollicitans seems to be equally negatively and positively phototropic, these tropic reactions evidently being dependent upon nutrition, as it is difficult to find a more blood-thirsty species. *Culex perturbans* is negatively phototropic and *cantator* positively, but not to the extent of *sollicitans*.

Positive phototropism is most prevalent among the salt marsh forms, *Culex sollicitans*, *Culex cantator* and *Culex taeniorhynchus* all acting positively but *Culex salinarius*, which is also a salt marsh mosquito, responds negatively.

Inasmuch as various factors influence phototropism, it might be supposed that the positive reactions of *sollicitans*, *cantator* and *taeniorhynchus*, all being biters of the first rank, are dependent upon their desire for food. Positive phototropism is not at all useful to mosquitoes inasmuch as it subjects them to attacks by their natural enemies.

The Effect of Temperature on the Molting of the Walking-stick, *Diapheromera femorata* Say (Orthop.).

By HENRY H. P. SEVERIN, Ph.D., Honorary Fellow, University of Wisconsin, and HARRY C. SEVERIN, M.A., Professor of Entomology, South Dakota State College of Agriculture and Mechanic Arts.

In a recent paper we (1) called attention to the fact that of one hundred *Diapheromera femorata* reared under as nearly normal or field conditions as possible during June, July and August, the months during which the development of this Phasmid occurs in its natural habitat in Wisconsin, 23 per cent. molted four times, 76 per cent. five times, and only 1 per cent. six times. The suggestion was also made that "in all probability temperature plays an important role in the rate of development." To determine with certainty what effect temperature has on the molting of this walking-stick, a number of experiments were performed.

In order to compare the data obtained by rearing some of these insects under normal conditions with specimens bred under a temperature either higher or lower than field conditions, the following table containing the averages of the intervals or periods between molts (stages or stadia) and the total duration of the periods (post-embryonic development) of five

TABLE I.
AVERAGES IN DAYS OF THE STAGES BETWEEN MOLTS OF DIAPHEROMERA FEMORATA REARED UNDER NEARLY FIELD CONDITIONS IN JUNE, JULY AND AUGUST.

Sex	Number of molts	Stadium I	Stadium II	Stadium III	Stadium IV	Stadium V	Stadium VI	Post-embryonic development
♂+O ₁ +O ₂	4	12.6	7.6	10	10.4			40.6
	4	13.8	9.4	9.6	8.6			41.4
	5	9.8	8	8.2	9.8	11		46.8
	5	11.6	8.4	8.8	9.2	11.4		49.4
	6	8	7	9	8	9	12	53

males and five females which passed through four molts, of five males and five females which passed through five molts, and of one female which molted six times, is copied from a previous paper (1).

Five specimens of *Diapheromera femorata* were reared at a high but not constant temperature. In this experiment, the walking-sticks were bred above a paraffine oven, the temperature in this region varying between 25 and 35 degrees C. The following table shows the interval, in days, between molts and the total duration of the stadia.

TABLE II.
STAGES IN DAYS BETWEEN MOLTS OF DIAPHEROMERA FEMORATA
REARED UNDER A HIGH TEMPERATURE OF 25° TO 35° C.

Date of Hatching	Sex	Number of Molts	Stadium I	Stadium II	Stadium III	Stadium IV	Stadium V	Stadium VI	Post-embryonic development	Date of Last Molt
May 4, 1910	♂	5	7	7	6	9	8		37	June 10
" " "		5	12	7	10	7	8		44	
Averages			9.5	7	8	8	8		40.5	
May 3, 1910	♂	6	12	7	8	7	7	7	48	" 20
" 16, "		6	9	8	7	6	7	9	46	
Averages			10.5	7.5	7.5	6.5	7	8	47	
May 13, 1910	♀	6	10	10	7	7	7	9	50	" 2

A glance at the averages of the post-embryonic developments in the following table shows that the male walking-sticks which passed through four molts under nearly normal conditions required about the same amount of time (40.6 days) as the male specimens which molted five times under a high temperature (40.5 days). Practically the same results were obtained with the male and female Phasmids which passed through five molts under nearly normal conditions, and six molts under a high temperature (Table III). If the averages of corresponding stadia of the male individuals which molted four and five times under a nearly normal and a high tem-

perature are compared in the following table, it is seen that the interval between molts is considerably shorter under a high temperature. The same is true, with two exceptions, of the male and female walking-sticks which passed through five molts under nearly normal conditions and six molts under a high temperature (Table III).

One would not hesitate to conclude from these results that *a high temperature shortens, on an average, the interval between molts.*

TABLE III.

AVERAGES IN DAYS OF THE STAGES BETWEEN MOLTS OF DIAPHOROMERA FEMORATA REARED UNDER NEARLY NORMAL CONDITIONS AND A HIGH TEMPERATURE OF 25° TO 35° C.

Temperature	Sex	Number of Molts	Stadium I	Stadium II	Stadium III	Stadium IV	Stadium V	Stadium VI	Post-embryonic development
Normal	♂	4	12.6	7.6	10	10.4			40.6
		5	9.5	7	8	8	8		40.5
High	♂	5	9.8	8	8.2	9.8	11		46.8
		6	10.5	7.5	7.5	6.5	7	8	47
Normal	♀	5	11.6	8.4	8.8	9.2	11.4		49.4
		6	10	10	7	7	7	9	50
High	♀	5							
		6							

De Sinéty (2) reared a walking-stick, *Leptynia attenuata*, at 30 degrees C. and found that, while the specimen completed its development more quickly under these conditions, yet the acceleration in development did not affect the interval between the four molts equally. He writes, "tandis que le premier est peu abrégé, le deuxième et le troisième le sont beaucoup et le quatrième est allongé."

In another experiment, ten male and five female walking-sticks were reared during the somewhat colder months of April, May and the early part of June. The following table shows the interval between molts and the post-embryonic development of each group of walking-sticks, the grouping being made according to sex and the number of molts.

If the averages of the post-embryonic developments of the male walking-sticks which molted five times under nearly normal conditions are compared in the following table with those of the male specimens that passed through four molts while exposed to a low temperature, it will be seen that the former

TABLE IV.

STAGES IN DAYS BETWEEN MOLTS OF DIAPHEROMERA FEMORATA REARED DURING THE SOMEWHAT COLDER MONTHS OF APRIL, MAY AND THE EARLY PART OF JUNE.

Date of Hatching	Sex	Number of Molts	Stadium I	Stadium II	Stadium III	Stadium IV	Stadium V	Post-embryonic development	Date of Last Molt
April 8, 1910	♂	4	14	12	10	14		50	May 28
" " "	♂	4	16	10	8	11		45	" 23
" 11, "	♂	4	14	8	8	16		46	" 27
" 14, "	♂	4	12	10	10	14		46	" 30
" 16, "	♂	4	13	9	11	15		48	June 3
Averages			13.8	9.8	9.4	14		47	
April 5, 1910	♂	5	15	9	8	12	14	58	June 2
" 10, "	♂	5	16	10	9	11	13	59	" 8
" 11, "	♂	5	13	8	9	12	15	57	" 7
" 11, "	♂	5	14	10	8	11	13	56	" 6
" 18, "	♂	5	11	10	10	12	12	55	" 12
Averages			13.8	9.4	8.8	11.6	13.4	57	
April 9, 1910	♀	5	15	8	10	11	14	57	June 5
" " "	♀	5	17	9	8	10	14	58	" 6
" 10, "	♀	5	17	9	8	12	12	57	" 6
" 12, "	♀	5	14	9	8	13	13	57	" 8
" 23, "	♀	5	11	9	10	12	11	53	" 15
Averages			14.8	8.8	8.8	11.6	12.8	56.4	

required about the same amount of time (46.8 days) as the latter (47 days). The female, which under nearly normal conditions cast its skin six times, required 53 days to complete its post-embryonic development, while the females which molted five times, while kept in a cold temperature, required

56.8 days (Table V). A comparison of the averages of corresponding stadia of the male and female Phasmids which were subjected to differences in temperature, shows that the interval between molts is longer on an average when the insects are kept in a cold temperature. It is evident, thus, that *a low temperature lengthens, on an average, the interval between molts.*

TABLE V.

AVERAGES IN DAYS OF THE STAGES BETWEEN MOLTS OF DIAPHEROMERA FEMORATA REARED UNDER NEARLY NORMAL CONDITIONS IN JUNE, JULY AND AUGUST, AND IN THE SOMEWHAT COLDER MONTHS OF APRIL, MAY AND THE EARLY PART OF JUNE.

Temperature	Sex	Number of Molts	Stadium I	Stadium II	Stadium III	Stadium IV	Stadium V	Stadium VI	Post-embryonic development
Normal Low	♂	5	9.8	8	8.2	9.8	11		46.8
		4	13.8	9.8	9.4	14			47
Normal Low	♀	6	8	7	9	8	9	12	53
		5	14.8	8.8	8.8	11.6	12.8		56.8

It is apparent that the effect of temperature on the duration of the stages, and the influence of temperature in determining the number of molts, are two entirely different problems. To ascertain what effect temperature has on the number of molts that the walking-stick undergoes, the following table should be examined:

An examination of Table VI shows that of the five specimens reared under the high temperature, three molted six times and not a single individual four times; also, of the fifteen Phasmids that were kept at the low temperature, five molted four times, ten five times, and not a single specimen six times. While the number of *Diapheromera* kept at the low and high temperatures is not exceedingly large, still these results show that *a high temperature has a tendency to increase the number of molts, while a low temperature decreases the*

number. In a previous paper (1) attention has already been called to the fact that "we have reared a number of *Diapheromera* which were hatched on the same day, fed with the same kind of food and kept in the same breeding cages throughout their entire life history under exactly the same kind of condi-

TABLE VI.

PER CENT. OF MALE AND FEMALE DIAPHEROMERA FEMORATA WHICH MOLTED FOUR, FIVE OR SIX TIMES UNDER THE DIFFERENT TEMPERATURES.

Temperature	Number of Molts	Number of specimens and sex	Per Cent.
High 25°-35° C.	5	2 ♂	40
	6	2 ♂, 1 ♀	60
Normal	4	18 ♂, 5 ♀	23
	5	34 ♂, 42 ♀	76
	6	1 ♀	1
Low	4	5 ♂	33½
	5	5 ♂, 5 ♀	66½

tions of temperature, and yet some specimens molted four times while others molted five times." The effect of temperature, therefore, does not alone explain these differences in the number of molts.

Summary—A low temperature lengthens, while a high temperature shortens on an average the interval between molts. A low temperature has a tendency to decrease the number of molts, while a high temperature increases the number.

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2. Sinéty, R. de, 1900. La mue chez les Phasmes du genre *Leptynia* [Orthopt.]. Bull. Soc. ent. Fr. No. 11, pp. 195-7.

Some New and Little-known Heteroptera from the Western United States.

By J. R. DE LA TORRE BUENO, White Plains, N. Y.

When Professor J. M. Aldrich made his Western trip last year to look for Packard's *Ephedra californica*, he most kindly offered to endeavor to get me some specimens of Uhler's *Gerris robustus*, originally described from Clear Lake, California. He was successful not only in his own particular quest, but also in securing the long-lost *Gerris*, and together with that a number of land forms which he most obligingly permitted me to work up for him. They follow with appropriate comment. The species, it should be noted, are typically Western with two exceptions, viz: *Harmostes reflexulus* Say and *Brochymena 4-pustulata* Fabr.

Notonecta indica Linné.

A long series from Garfield, Utah, and Lake Elsinore, California, received through Prof. J. F. Abbott, who has the Corixas, and some labelled Smaller Soda Lake, Nevada. These are very interesting habitats, as the lakes are salt or alkaline, thus tending to show that *Notonecta* is not necessarily a fresh water insect.

Acanthia xanthochila Fieb.

Lake Elsinore, California; Soda Lakes, near Hazen, Pyramid Lake, and Winnemucca Lake, Nevada; Garfield, Utah.

This is a most widespread species, and is practically Holarctic in its distribution. The twelve specimens taken at these various places are typical.

Acanthia coriacea Uhler.

Brigham, Utah. One specimen.

Acanthia polita Uhler.

Garfield, Utah. One example.

Acanthia sp. (near *saltatoria* L.).

Highland Springs Lake. Three specimens.

Gerris gillettei L. & S.

=*Limnotrechus productus* Uhler. Hem. of Colo.

One female specimen from Garfield, Utah, on brackish water. This agrees in every particular with the original description and with the type in the collection of the Colorado Agricultural Experiment Station of Fort Collins, kindly loaned to me for study by Prof. C. P. Gillette. This is the first authentic record of the species since it was first described, and serves to establish its character as a good species. Its chief superficial character separating it from *Gerris* (*Limnotrechus*) *marginatus* Say, lies in the anal cerci, which in *marginatus* are short and comparatively stout, while in *gillettei* they are long, attaining the extremity of the abdomen and comparatively slender.

Gerris robustus Uhler.

Four apterous males and one female, and one winged male and one female, from Highland Springs, California. Prof. Aldrich writes thus about the locality: "The springs that give the name to the place come out a short distance from the sanatorium, and I ran down there with my net. There are perhaps twenty springs, all carbonated that I saw, and they make quite a little stream. On this there were a few skippers, and I got half a dozen, all short winged but large. These were all I could get for you. They were collected about ten miles from Clear Lake, and as near as I can remember they were the only skippers I saw on the trip."

It may be readily seen from the preceding that while not from the very place whence Uhler got his single female type, it was sufficiently near to act as a type locality, given the wide spread of the Gerrids, which are great travelers. The winged female in *structural* characters agrees with Uhler's description, but not so in color, as I shall explain more at length elsewhere. The species is a widespread Western form, which has come into my hands from various other sources. Several of the specimens had an alkaline crystalline accretion

on the hind tibiae and tarsi, doubtless from the highly charged water on which they lived.

Rasahus thoracicus.

One specimen from Santa Monica, California.

Zelus (Pindus) occiduus n. sp.

Belongs in the sub-genus *Pindus* of Stal, which is characterized by the possession of four black spines on the thorax, two lateral and two on the disc.

Differs from *Zelus (Pindus) socius* Uhler in having the 1st and 3d joints of the antennae subequal, the first a little over three times as long as the second, and the 3d somewhat less than three times the second. Proportion of antennal joints 1st: 2d: 3d:: 50: 16: 44. Third joint in male scarcely stouter than 2d and of even diameter throughout; not tapering.

Rostrum reaching to anterior coxae; joint 2 five times as long as 1 and more than six times as long as 3. Proportions: 1st joint: 2d: 3d:: 4: 20: 3.

Hemelytra with the main corial vein whitish.

Legs slender, femora thickened and slightly darker toward the distal end; femora of first pair of legs thickest and longest; of second pair, thinnest and shortest; hind femora intermediate in thickness and length.

Proportions:—Anterior femora: middle: posterior:: 5.1 mm.-5.6 mm.: 3.6 mm.-4 mm.: 5 mm.-5.4 mm.

Head, length: 2.6-2.5 mm.; prothorax, 2.4-2.1 mm.; scutellum, 1.2-1 mm.; abdomen, length from tip of scutel; 6.8-6.4 mm.; total length, 13-12 mm.; greatest breadth (abdomen) 2.6-2.4 mm.; length: breadth:: 5:1.

Described from two males taken by Prof. J. M. Aldrich at Owen's Lake, California, July 27, 1911. Cotypes in collections of J. M. Aldrich and mine.

Lygaeus reclivatus Uhler.

Owen's Lake, California, two specimens; Pyramid Lake, Nevada, one specimen.

Lygaeus bicolor H. S.

Santa Monica, California, three specimens.

Largus convivus Stal.

Santa Monica, California, two specimens.

Harmostes reflexulus Say.

Winnemucca Lake, Nevada, one specimen.

Alydus setosus Van Duzee.

Santa Monica, California, one specimen, apparently first record since the type.

Anasa ? obliqua Uhl.

Santa Monica, California, one specimen.

Brochymena quadripustulata Fabr.

One specimen from Brigham, Utah.

Antigeny in Nearctic Butterflies (Lepid.).

By HENRY SKINNER, M.D., Sc.D.

Antigeny has been defined as sexual dimorphism and it has the advantage of expressing the idea in one word. Many of our butterflies show marked differences in appearance between the sexes, of a secondary sexual character, and while there have been many theories to account for these differences, none of them appear to the writer to be very satisfactory or convincing. There is a great difference among the various species as to the degree or amount of antigeny shown. In some cases it is so great that the sexes of one species have not infrequently been described as totally different species and in other cases the differences between the sexes is slight or non-existent.

Examples of marked antigeny are shown in *Argynnis diana*, *Neophasia terlooti*, *Meganostoma eurydice*, *Pieris amaryllis*, *Colias christina*, *Papilio turnus*, *Pamphila zabulon* and *hobomok* and others. If we include the Hesperidae about one seventh of the North American butterflies may be said to show antigeny. Whether these have any advantage in the struggle for existence or not, I will not discuss in this article.

In the large genus *Argynnis* there are a number of antigenetic species . . . *diana*, *idalia*, *cybele*, *nokomis*, *leto*,

nitocris, *polaris* and *alberta*. *Cybele* is included because in some parts of its range the female is sometimes white or cream color but ordinarily the sexes are marked alike. There are no striking examples in *Melitaea* except that in *palla* there is a melanic female, as well as the tawny female. In *Synchloe adjutrix* there are two kinds of males and two kinds of females, which were formerly known as different species.

There are several good examples in the Satyridae. *Debis creola* has a number of velvety patches on the fore-wing in the male. Both sexes of *Coenonympha haydeni* were originally described from males, but there are marked differences in color between the sexes, so that they may be distinguished at a glance. *Satyrus gabbi* is another Satyrid showing sexual dimorphism.

Thecla laeta is the most marked instance in its genus. In *Lycaena* there are a number of species . . . *heteronia*, *clara*, *fulla*, *pheres*, *antiacis*, *saepiolus*, *battoides*, *podarce*, *scuderi*, *acmon*, *pseudargiolus*, *comyntas*, *isola*, and others to a lesser degree. *L. acmon* is antigenetic, and a very closely related species *neurona* is not. Until recently the two species have been confused. Which one has the advantage over the other? The females of *neurona* are alike in appearance, being dark brown. In the genus *Chrysophanus* we have *heloides*, *rubidus*, *sirius*, *arota*, *thoe*, *mariposa* and *zeroe*, all showing antigeny.

In the Pieridae are a number of examples, including *Lepidalis melite*, *Neophasia terlooti*, *menapia*, *Pieris neumoegeni*, *amaryllis*, *monuste* (often has a melanic female), *Anthocharis genutia*, *Catopsilia* spp. (which often have white females), *Meganostoma caesonia*, *eurydice*. *Colias* also shows antigeny in many species. *Christina* has a yellow and a white female and *C. behri* is also a good example of diversity. Perhaps the best example in *Terias* is *mexicana*.

In *Papilio* are *turnus*, *polyxenes*, *troilus* and *philenor*.

Most of the Hesperidae are distinctly antigenetic, the males being of a bright color and also have a distinct stigma, brand or sex mark. *Pamphila zabulon* has the female dark brown and

the male yellow and a close ally, *hobomok*, has two distinct forms of female.

From these many antigenetic forms, a few have been selected and their remarkable difference has been said to have been brought about through mimicking another species which is said to be nauseous to birds. Mr. W. H. Edwards has written a very interesting account of *Papilio turnus glaucus* and it may be of moment to briefly refer to what he says of it.

"Some unknown influence caused the black female form to appear as a distinct variety, and that, owing to some circumstance, it thereby gained an advantage over its rival, which caused it finally to supplant the other." There is one statement in the above that is not correct. The black female has not supplanted the other. There is also an assumption to which I take exception. Does anyone know which one appeared first and why? Many species have a black or blackish female. *Pamphila hobomok* is the exact counterpart of *turnus* as regards trimorphism. *Lycaena pseudargiolus* presents an analogous condition, only reversed, as it has two kinds of males, a black one and a blue one. This is also true in a lesser degree of *Colias philodice* which rarely has a melanic male. Mr. Edwards impartially presents both sides of the argument and my remarks are not in criticism of his article. I only use it as a text. He found no evidence that the heat of summer or the cold of winter exerts any influence in causing one or the other form of the female. He also mentions the theory of protection due to the difference in color between the females and thinks the gay color of the yellow female makes it an easier prey of birds. He elaborates on the bird theory but in relation to this it is only necessary to say that the Biological Survey has examined fifty thousand bird stomachs and only found butterflies in five stomachs. No species of butterflies have been found in the stomachs of American "Flycatchers." He further says "*Papilio philenor* has a strong disagreeable scent, and it has been suggested by Mr. Mead, that this rendering it distasteful to birds would serve to protect other black species flying with it." The dis-

agreeable scent of *philenor* is disputed by Scudder. It is interesting to know that Mr. Mead suggested this theory at that time. Mr. Edwards accounts for the scarcity of yellow females in West Virginia as due to the influence of birds.

He also says, however, that the yellow females are more numerous than the black in Georgia and Florida. Attention is also called to the fact that in certain places in the mountains of the south the black females are not found.

Jeheber* believes that *glaucus* is the result of the larva feeding on "diseased food, the leaves being sprinkled over with fine black spots and completely covered with a gummy substance." While this seems unlikely it has not been disproved.

Turnus is found from the Gulf of Mexico to the latitude of the Yukon River in Alaska and possibly still further north. If we consider the topomorph *rutulus* as the same species, and I believe it is, the species also flies from the Atlantic to the Pacific Ocean. The evidence in favor of *glaucus* being brought about by mimicry is almost nil, while the evidence against it is very considerable. The species swarms in countless thousands in the north where *glaucus* does not exist. In early July along the line of the Canadian Pacific Railway, in Ontario, I have seen the species in immense numbers, far more plentiful than I have ever observed it in the south where *glaucus* is found. The species shows a remarkable instance of trimorphism, but there are a number of cases of like character in butterflies and other insects.

As mentioned above *Pamphila hobomok* is an exact counterpart of *turnus* in this respect. The male is tawny and there is a female like the male in appearance and another female that is black or dark brown, and analogous to the dimorphic *glaucus*. There is still another remarkable example of antigeny in *Lycaena pseudargiolus*, but in this case the males are different in appearance, the one being blue and the other black. This is the only instance I recall of the males being dimorphic unless it be in the black male of *Colias philodice* that rarely occurs.

*Ent. News. Vol. 16, p. 111, 1905.

Strange to say the black male of *pseudargiolus* is found in about the same territory as *glaucus* and this would make one think that it was also climatic in origin. The comparative absence of *glaucus* in the mountains and also north of latitude 43 would also indicate a climatic influence.

What is the cause of the extraordinary antigeny seen in *Neophasia terlooti*? The male in this species is white and the female orange. The female of the species was once sent to me as a "little *Danais*" and it really looks like one. Here would be a good opportunity to build up a mimicry theory. Who can tell the true meaning of antigeny among insects? There has not been put forth a single explanation that has stood any logical analysis. In regard to the black male of *Lycaena pseudargiolus* one would think that if it were produced by mimicry and so wonderfully protected that it would be more plentiful in the range of the species where it is found.

If the mimetic origin of antigenetic species accounts for them it would seem logical to think that in time all species will become dimorphic. At present, however, I see no reason for believing that the antigenetic species have any advantage over those having similar appearing sexes. The females are protected by the great difference of habit in many of them. This is shown in *Ornithoptera brookeana*, in many species of *Argynnis*, and in other butterflies. This is also well illustrated in our collections where the males of species of butterflies greatly outnumber the females. This comes from the difference in habit of the females. Is it logically correct to build up mimicry theories to explain antigeny in a few butterflies and ignore equally as well marked cases of antigeny in other species?

Change of Address.

Prof. C. F. Baker, of the Department of Biology of Pomona College, has resigned to accept a professorship in the University of the Philippines. He will be located at the College of Agriculture Los Banos, Philippine Islands. He is accompanied by his Cuban collector, Julian Valdez.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., JANUARY, 1913.

As the New Year opens and the winter season gives some respite from field work, and perhaps some leisure to think over plans for the future, some of our readers may find helpful suggestions in the following sentences, even though now nearly two years old, from Professor Gerould:

A rich field for conquest awaits any one who chooses to leave the beaten tracks of entomology and scout among the fastnesses of experimental evolution. When one considers the remarkable results that have been accomplished single-handed by such observers as Standfuss, Tower, Doncaster and T. H. Morgan, not to mention many others, the possibilities achieved in this field if the huge army of observers already interested in insects should attack in an organized way the problems of variation, the inheritance of acquired characters, mutation and natural selection, polymorphism and sex, mimicry and protective resemblance, can hardly be overestimated. Desultory observations of the strolling naturalist will not help much in this conquest, but long-continued breeding of carefully selected strains under well-controlled conditions cannot fail to win valuable results.

Entomological societies and journals of the future, in order to contribute effectively to the real advancement of science should organize co-operative plans of research along these lines and enlist the services of the countless observers whose random notes now fill their archives.—(*Science*, February 24, 1911, page 310).

Those who make use of the Entomological Literature will notice a few changes which the compilers thought to be advantageous. Beginning with this issue, papers treating of the Arachnida and Myriopoda will be included, and further, the papers of a purely or partially systematic nature will be grouped separately at the end of their respective classes or orders. These changes, we hope, will be to the advantage of those who have use for this section of our journal.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Color of Hemiptera.

The bright coloration of most Hemiptera is due to a fatty tissue known as pseudovitellus, and this tissue invades the developing egg at an early stage of maturation. . . . Dr. Buchner, "Studien an intracellularen Symbionten" (part 1., Archiv f. Protistenkunde, vol. xxvi, 1912), has taken up the detailed study of the range and nature of this form of symbiosis, and he gives a very interesting and well-illustrated account of his recherches. (*Nature*, Oct. 17, 1912, p. 197.)

The Insects' Homer.

Under the heading of the "Insects' Homer" Mr. Maurice Maeterlinck directs attention in the September issue of *The Fortnightly Review* to a little-known work by J. H. Fabre, in ten volumes, entitled "Souvenirs entomologiques." . . . In these volumes, from which copious extracts are given, Fabre recorded the results of fifty years of observations, study and experiment on a number of insects, including wasps and wild bees, certain gnats, flies, beetles, and caterpillars.

(*Nature*, Oct. 17, 1912, p. 196)

Caterpillars and the Weather.

[The Entomologist of the Utah Agricultural College Experiment Station, Mr. E. G. Titus, sends the copy of the following letter received in his Station correspondence.]

"1 Nov. 1912. I would like to know if in your opinion the presence of a very unusual number of caterpillars this fall has any bearing on the weather, either past or future.

We have had a cold and wet spring and an early and wet fall here this year. Do you think the presence of caterpillars is beneficial or detrimental to the soil? G. M."

***Feltia venerabilis arida* n. subsp. (Lepidop.)**

Male differs from typical *venerabilis* by the very white patagia, contrasting with the dark collar; yellowish-white abdomen; creamy-white ground color of anterior wings, the dark markings contrasting; and the white hind wings. Holland's figure 26, pl. XXII. in the Moth Book, is an approach to *arida*, agreeing in the general color of the wings, but our moth is paler, and the abdomen and collar differ. The type of *arida* from Boulder, Colorado, end of September, 1912, has been placed in the U. S. National Museum.—T. D. A. COCKERELL.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in Heavy-Faced Type refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues, which are generally dated the year previous.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

4—The Canadian Entomologist. 5—Psyche, Cambridge, Mass. 7—U. S. Department of Agriculture, Bureau of Entomology. 8—The Entomologist's Monthly Magazine, London. 9—The Entomologist, London. 10—Nature, London. 11—Annals and Magazine of Natural History, London. 22—Zoologischer Anzeiger, Leipzig. 35—Annales, Societe Entomologique de Belgique. 37—Le Naturaliste Canadien, Quebec. 38—Wiener Entomologische Zeitung. 40—Societas Entomologica, Zurich. 46—Tijdschrift voor Entomologie. 79—La Nature, Paris. 84—Entomologische Rundschau. 89—Zoologische Jahrbucher, Jena. 97—Zeitschrift fur wissenschaftliche Zoologie, Leipzig. 109—Proceedings, Royal Society of Queensland, Brisbane. 119—Archiv fur Naturgeschichte, Berlin. 159—Bollettino, Laboratorio di zoologia generale e agraria della R. S. Superiore d'Agricoltura in Portici. 166—Internationale Entomologische Zeitschrift, Guben. 175—Aus der Natur, Berlin. 190—Deutsche Entomologische Zeitschrift "Iris," Dresden. 193—Entomologische Blatter, Cassel. 198—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. 211—Popular Science Monthly, Lancaster, Pa. 217—Bulletin, Societe Entomologique

d'Egypte. **320**—New Jersey Agricultural Experiment Station, New Brunswick. **323**—Broteria, Revista de Ciencias Naturales do Collegio de S. Fiel. (Ser. Zoologica). **338**—Annales, Sociedad Cientifica Argentina, Buenos Aires. **340**—Maine Agricultural Experiment Station, Orono. **344**—Zeitschrift, Induktive Abstammungs und Vererbungslehre, Berlin. **373**—Proceedings, Royal Physical Society...., Edinburgh. **376**—Bulletin, Societe Lepidopterologique de Geneve. **324**—Journal of Animal Behavior, Cambridge, Mass. **364**—Biologica, Journal Scientifique du Medecin, Paris. **365**—Collections Zoologiques du Baron Edm. de Selys Lonchamps, Bruxelles. **368**—The Monthly Bulletin of the State Commission of Horticulture, Sacramento, Cal. **369**—Entomologische Mitteilungen, Berlin-Dahlen. **381**—Experiment Station Record, Washington, D. C. **399**—Proceedings of the Cambridge Philosophical Society, Cambridge, England. **400**—Die Fauna der deutschen Kolonien, Berlin. **401**—Catalogue of the Lepidoptera Phalaenae in the British Museum, London. **402**—University of California Publications in Zoology, Berkeley, Cal. **403**—Country-Side, a Monthly Magazine Devoted to Nature, London. **404**—Report of the Quebec Society for the Protection of Plants. **405**—University of Toronto Studies, Biological Series. **406**—Boletin del Museo Nacional de Chile, Santiago de Chile. **407**—Journal of Genetics, Cambridge, England. **408**—Dominion of Canada Department of Agriculture Experimental Farms, Division of Entomology, Ottawa.

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REVIEWS.

The long-expected SPIDER BOOK by J. H. COMSTOCK appears as one of Doubleday and Page's series of popular Natural History books,

best known to entomologists by the Butterfly Book of W. J. Holland. In convenient size and at moderate price it well fills the place of the scarce and expensive work of McCook, published twenty years ago. The first chapters, occupying about one-eighth of the book, treat of Arachnida in general and their relations to other Arthropoda, followed by an account of the orders of segmented Arachnida and the Mites. The remainder of the book is devoted to the Araneida or Spiders proper. About a hundred pages are occupied with anatomy and general habits illustrated by instructive diagrams and detailed figures of internal organs and external parts.

A new study has been made of the male palpi which furnishes a useful key to the complications of these peculiar organs. Beginning with *Filistata* and *Eurypelma* which have a simple bulb on the end of the palpus terminating in a short tube, it passes to *Atypus* and *Pachygnatha* in which the tube is accompanied by an appendage lying parallel to it, and from these to the complicated palpi of *Linyphia* and *Epeira*. In the latter the terminal joint of the palpus is modified into a hollow "cymbium" in which the palpal organ is partly enclosed with sometimes a "paracymbium" often of characteristic form, articulated at one side. The palpal organ is here shown to consist of basal, middle and apical divisions each of which may develop chitinous appendages. The illustrations and system of names furnish means for comparing palpi of different species and in different conditions. In these studies of details the palpi were expanded and made transparent by well known methods, but it is hoped the reader will not be led to the conclusion that all palpi need to be prepared in this way for ordinary comparison.

A feature of the book is the abundance of photographic illustrations both of spiders themselves and of their webs, especially the round webs and those of the Cribellata. Particularly good are the webs of *Theridiosoma* and of *Epeira labyrinthica* and the enlarged threads of *Epeira*, *Amaurobius* and *Filistata*. The webs of *Linyphia* and *Theridium* are less successful but there are several good ones of *Agalena* and *Tegenaria*. The spiders were photographed from life or were killed by cyanide and then spread and photographed as soon as possible. Some of the most successful are *Herpyllus ecclesiasticus* p. 318, *Gnaphosa gigantea* on its egg cocoon p. 321, *Aranea frondosa* pp. 488 and 485, *Aranea nordmanni* p. 471, and *Argiope aurantia* p. 435. The sea of gossamer, p. 216, and the webs of *Linyphia litigiosa* p. 393, show the beautiful effects of large quantities of spider webs in the landscape. Plates have been entirely avoided and all the illustrations are distributed through the book as near as possible to the text to which they refer.

In a book intended for popular use, one of the things most to be

desired is a simple and intelligible classification, but here the author has not been able to restrain his enjoyment in the complicated and unusual. In the genus *Argiope*, for example, we have three closely related species and these are described under three different generic names while all come into the subfamily, Argiopinae. The family Argiopidae includes the Epeiridae in general, and the superfamily Argiopoidea all the spiders except the Aviculariidae. Even our few English names do not escape change, for "the garden spider," long a nickname of *Epeira diademata*, is here applied to *Argiope*. There is also an unfortunate tendency to abandon names long in common use and to substitute names that are older but less certain. *Dictyna volupis*, for example, is replaced by *Dictyna foliacea* Hertz which may be any one of several species. So the familiar *Epeira insularis* is replaced by *Aranea gigas conspicellata*. Tables are used to a large extent as keys to the classification and here also the tendency is toward the complex and difficult. In the general table the reader is brought at once to such questions as whether a spider has two or four lungs, whether it has a cribellum and calamistrum or not, and whether it has two or three claws on the feet. In the descriptions of species a large amount of space is given to peculiarities of structure and habits and to nests, webs and cocoons with plenty of illustrations a large part of them new and nearly all good.

References are given to other publications on American spiders of which there is a list covering seven pages at the end of the book.—J. H. E.

A PRELIMINARY LIST OF THE INSECTS OF THE PROVINCE OF QUEBEC.

Part I.—Lepidoptera. By ALBERT F. WINN, Westmount. Published as a Supplement to the Report of the Quebec Society for the Protection of Plants. 1912.

This paper consists of 103 pages and Dr. J. B. Smith's New Jersey List was adopted as a model. The distribution and date of capture are given and in some cases the species are illustrated. It is a useful contribution to our knowledge of distribution.—H. S.

INJURIOUS INSECTS: HOW TO RECOGNIZE AND CONTROL THEM. By WALTER C. O'KANE, Entomologist to the New Hampshire Experiment Station and Professor of Economic Entomology in New Hampshire College. The Macmillan Company, New York. Price \$2.00 net.

This work contains 379 pages and 606 figures of insects of which 600 figures are stated to be original. This is really a very remarkable feature of the book after one has been accustomed to seeing the same

old cuts from the time of the father of economic entomology. Another excellent feature is that in many instances the size of the insect is given. Often in such works the novice has no way of telling how big the insect is that he sees figured. Another useful feature is the reference to the full reports on the species mentioned. The insect pests are divided into three groups. 1. Pests of garden and field crops; including all injurious species found on such plants as corn, potatoes, cucumbers, wheat, squashes and the like, also greenhouse pests. 2. Pests of orchards and small fruits, currants and similar bush fruits, and strawberries or other low-growing plants, usually designated as fruits. 3. Pests of the household, of stored products, and of domestic animals. These comprise the common injurious species that do not feed on living plants. There are chapters on structure, habits and classification; insects as carriers of disease; methods of insect control. The work is one that will undoubtedly prove of use to those who have need for such a book. The arrangement should make it possible for the novice to find the insect doing the damage, especially in view of the fact that so many species are illustrated.—H. S.

Doings of Societies.

THE PACIFIC COAST ENTOMOLOGICAL SOCIETY.

The forty-first regular meeting of the Society was held on the evening of August 19, 1911, at the Yoke Point Grill, San Francisco.

President Van Dyke in the chair. Twelve members and five guests were present. The annual election of officers took place with the following results: President, Dr. E. C. Van Dyke; Vice-President, J. E. Cottle; Secretary and Treasurer, Dr. F. E. Blaisdell.

Mr. Ehrhorn stated that Mr. Koebele was in Germany working on the horn fly problem. A communication was read from Mr. L. E. Ricksecker. President Van Dyke made some remarks on Le Conte's collecting trip to the Pacific Coast and his work about Vallecitos.

Mr. J. C. Bridwell stated that Prof. Herms was traveling in Europe, visiting collections and studying parasites.

President Van Dyke spoke about the list of butterflies of the San Francisco Peninsula published by Mr. F. X. Wil-

liams, and expressed a wish to have the lepidopterists continue it and include the entire order. He stated that the coleopterists were getting data together for a list of the entire Bay Region, a thing that he felt would be of much value. He also referred to the visit of Professors Wickham and Aldrich to this coast. Prof. Aldrich visited the several saline and fresh water lakes in Utah, Nevada and California, studying the insects which inhabit them, especially a genus of Diptera, *Ephydra*. The doctor stated that Mr. Wm. Mann at last accounts was still investigating in the barren regions of Brazil, south of the Amazon, and that he was contemplating a trip up the Amazon.

The members of the Society were pleased at having Mr. J. G. Grundel again present and recovered from his recent illness.

Mr. Chas. Fuchs reported his summer outing at St. Helena, Napa County, Calif. Mr. Cottle gave an account of his trip to the Yosemite. He stated that conditions were very unfavorable there and that snow was very abundant in June. A number of good things were captured on Cloud's Rest, such as *Melitaea sacramenti*.

Mr. J. C. Huguenin spoke about his vacation of one week in Marin County, Calif.

Mr. J. C. Bridwell stated that collecting in the Imperial Valley was prolific of good results. In his own specialty, the Philanthidae, species were taken in considerable series and the color varied from black to ferruginous.

Mr. Ehrhorn said some interesting things about the Hawaiian fauna.

Mr. Nunenmacher stated that he had made a special effort during the last three years to study the distribution of *Omus*, and that during his trips to northern California and southern Oregon, he had discovered many interesting facts pertaining to them.

Messrs. Nunenmacher, Huguenin and Cottle exhibited a number of interesting species.

Refreshments and adjournment.

The forty-second regular meeting was held on the evening of November 25, 1911, at the Yoke Point Grill, San Francisco. President Van Dyke in the chair. Nine members and two guests were present.

Mr. Grundel exhibited numerous specimens of Coleoptera and Lepidoptera, which had been collected in the vicinity of Martinez, Calif.

Mr. Bridwell made some remarks about collecting in the Imperial Valley. *Asida*, *Cryptoglossa* and *Eusattus muricatus* were obtained by digging about the roots of plants; at Banning a Buprestid larva was taken from an *Opuntia* stalk. He also exhibited the work and specimens of a species of *Lyctus* seriously injuring floors and flooring of tan bark oak. Specimens of two apparently new genera of Scoliidæ from southern California were shown.

Mr. Sternitzky reported a visit to Glen Allen, Eldorado County, California.

Mr. Huguenin reported some observations on the larvæ of *Halisidota edwardsii*.

Mr. Nunenmacher stated that careful collecting around the bay of San Francisco was yielding many good things, such as *Hyperaspis psyche* Casey, *H. nunenmacheri* Casey, *H. 4-oculatus* with different sized spots, *Zagloba ornatus* Horn, *Exochomus californicus* Casey, varying much in size; *Scymnus guttulatus* Lec, and *Cymatodera ovipennis* Lec. The best time for collecting Coccinellidæ was stated to be late in the season—from September to the following March. They are particularly partial to a small shrub that is very abundant. As many as fifteen species have been taken at one collecting from this scrub oak-like plant.

President Van Dyke proposed the name of Prof. O. B. Johnston as an honorary member. Prof. Johnston was unanimously elected to membership. After exhibition of specimens, adjournment and refreshments.

The forty-third regular meeting was held on April 20, 1912, at the residence of Mr. J. E. Cottle, 2117 Bush St., San Francisco. President Van Dyke in the chair. Twelve members and seven guests were present.

The Secretary stated that Mr. Frank Stephens had been proposed for membership by Mr. L. E. Ricksecker. Dr. Blaisdell seconded the proposal. Mr. Stephens was elected in the usual way.

The Secretary presented a revised list of the honorary members of the Society, as follows:

Prof. O. B. Johnston, of Seattle, Washington.

Prof. C. W. Woodworth, of the University of California.

Prof. Vernon Kellogg, of the Stanford University.

Prof. J. J. Rivers, of Santa Monica, Calif., and

Dr. L. O. Howard, of the U. S. Nat. Museum, D. C.

Mr. Nunenmacher gave an interesting talk on his studies in the Coccinellidae. These studies were mainly on the genus *Hyperaspis*, and based on *H. undulatus* as a stem-form. A diagram showing the relationships of the species was also exhibited.

Mr. Huguenin reported some very interesting observations on the habits and relations of certain species of *Lycaenae*. He stated that a colony of *L. antiacis* had been located on the slope of a hill, the area inhabited by this species being surrounded by trees and not over 100 x 7 yards in extent. *Antiacis* was found from March to April, ten to twenty specimens being taken within two hours. Six or seven *L. xerces* were also taken in that same place and at the same date. Both species were flying together. Mr. Huguenin stated that the life-histories of the species should be worked out and thus determine the relationships of the different species.

Mr. J. G. Grundel stated that he had reared three so-called species of *Alypia* from the same batch of eggs.

President Van Dyke presented to the Society a photograph received from Prof. O. B. Johnston.

A paper on the *Aleocharinae* (fam. Staphylinidae, order,

Coleoptera) from the Aleutian Islands, by Dr. A. Fenyes, was then presented and read. It was moved, seconded and voted to publish the paper.

President Van Dyke gave a talk on the relationships and distribution of the species of the Coleopterous Sub-Family, *Carabinae*.

Mr. Huguenin exhibited 180 species of insects collected at Lagunitas, Marin County, Calif.

Communications were read from Mr. Harry Lang, of Atlanta, Ga., and Mr. L. E. Ricksecker, of San Diego, Calif.

Social discussion and refreshments followed.

The forty-fourth regular meeting or Annual Field Day was held on May 19, 1912, at Lagunitas, Marin County, California. Six members and ten guests attended the outing. The day was a very rainy one and very little collecting was done. The members spent the day under cover and around a fire.

The Secretary reported a communication from Mr. Frank Stephens, to the effect that Mr. L. E. Ricksecker had been suddenly stricken and was seriously ill. The members requested the Secretary to write and express their sympathy to the family.

F. E. BLAISDELL, *Secretary*.

FELDMAN COLLECTING SOCIAL.

Meeting of June 19, 1912, at 1523 South Thirteenth Street, Philadelphia; twelve members were present. President Haimbach in the chair.

Mr. Wenzel, Sr., read extracts from a letter received from our fellow-member, C. T. Greene, now located at East Falls Church, Virginia, telling how he secured the eggs of a Dipteron by placing a female in a jar with a piece of bark soaked in sap.

Mr. Geo. M. Greene exhibited the larvae, pupae and imago of *Physonota unipunctata* Say (Col.) collected by himself in Boonton, New Jersey, July 10, 1901. The envelope contain-

ing samples of the food plant disappeared so it was impossible to identify it. He had taken the first specimen of this Canadian beetle in the state hibernating, March 9, 1901, underneath a stone; this was shown. Also reported several specimens of *Calosoma willcoxi* LeC. (Col.) captured at light, Philadelphia, May 24, 1912.

Mr. Wenzel showed a large series of *Perothops mucida* Gyll. (Col.) from Twin Oak, Pennsylvania, June 13, 1912, collected on hickory; also said that *Centrodera picta* Hald. and *Chrysobothris azurea* LeC. had been taken this season locally.

Mr. Daecke said that one day while collecting at Hunter's Run, Pennsylvania, in an abandoned pass he had seen a wasp flying around and had followed it and had caught it at its nest. Both were shown, the species being *Vespa diabolica* Sauss. According to the New Jersey list, this species makes its nest under ground. Also recorded and exhibited the following: *Oryssus terminalis* Newn., *Euthera tentatrix* Loew., a rare tachina fly and *Adela ridingsella* Clem., all from Hunter's Run, May 30, 1912. He exhibited also a specimen of *Acronycta tritona* Hbn., the larva of which was taken at Lucaston, New Jersey, September 27, 1911, feeding on huckleberry, the adult emerged June 2, 1912.

Mr. Kaeber exhibited dried Russian peas; said two bags had been received from New York, one of which was about 80 per cent. infested, but all the beetles were dead, having been killed in cold storage. Specimens had been extracted and were shown. They were identified as *Bruchus quadrimaculatus* Fabr. He stated that he had noticed that *pisorum* Linn., a larger species was found in a smaller pea and only one specimen in each, while this species was smaller and several specimens were found in each pea. He was wondering if the size of the pea really had anything to do with the number of specimens found. Mr. Wenzel said it was open to doubt that the peas shown were infested in Russia as the species of *Bruchus* is found here.

Meeting of September 18, 1912, at 1523 South Thirteenth Street, Philadelphia; ten members were present. President Haimbach in the chair.

Mr. Wenzell, Sr., exhibited nests of a species of *Protapanteles* from Philadelphia Neck, September 15, from which he had bred this small wasp by the hundreds. These nests have the texture of spider webs for which he had first taken them. He also said that Mr. Green, of Easton, Wenzel, Jr., and he had taken an automobile trip to southern New Jersey the last week in June, touching at Atco, Da Costa, Hammonton, Egg Harbor, May's Landing, Tuckahoe, Cape May Court House, Anglesea, Stone Harbor, Vineland, Millville, Malaga and Willow Grove; said that the Weymouth district would be a great place for Dipterists. In the Coleoptera the regular species were found, but in general collecting was very poor. Mentioned *Tettigaea hieroglyphica* Say (Hom.), saying it was frequently beaten in the net early in the morning when it seemed numb from the cold, but later in the day it could not be caught. *Cicindela abdominalis* Fabr. was mentioned among the catches and a specimen of *Dorcus parallelus* Say from the typical *brevis* district; this specimen is smaller than the smallest mentioned in Dr. Horn's paper—both are in the Wenzel collection and were shown. The strong lamps from the auto were used at night, but not even a mosquito was attracted.

Mr. Geo. M. Greene exhibited a very large *Megarhyssa atrata* Fabr., collected by C. T. Greene, Castle Rock, Pennsylvania, June 4, 1911, and an extremely small one collected by W. J. Nash, Overbrook, Pennsylvania, August 8, 1912. Typical specimens, male and female of *M. greeni* Viereck were also shown and the extremes in size, all collected by W. J. Nash at Overbrook, August 11 and 18, and September 8, 1912. A fine specimen of the moth, *Phlegethontius cingulata* Sm. and Abb., collected by himself on tree trunk at Overbrook, September 8, 1912, was also shown. Also a specimen of *Carabus sylvosus* Say, Castle Rock, Pennsylvania, September 2, 1912, with wing aberration.

Mr. Harbeck exhibited and recorded a butterfly *Feniseca*

tarquinius Fabr., Pocono Lake, Pennsylvania, July 23, 1912, and a pair of the hornet, *Vespa consobrina* Sauss., Manahawken, New Jersey, September 2, 1912. Two species of *Tabanus*, new to his collection, were also shown, all taken by himself.

Mr. Daecke exhibited a pair of the fly, *Stylogaster neglecta* Will., from Hunter's Run, Pennsylvania, July 28, 1912, in coitu. Had often wondered how copulation was accomplished by the species where the female has a long ovipositor but this could readily be seen in the specimens shown. Also a block covered with moss was shown to be used as a pincushion for ooo pins.

Meeting of October 16, 1912, at 1523 South Thirteenth Street, Philadelphia; twelve members were present. Mr. Green, of Easton, Pennsylvania, visitor. President Haimbach in the chair.

Mr. Wenzel, Sr., remarked on the genus *Omus*, specially mentioning a species of W. Horn's and one of Casey's. Read a communication of October 12, from Mr. Dury, of Cincinnati, Ohio, in which he says, "*Sandalus niger* Knoch (Col.) was flying around a few days ago as it does the latter part of September and beginning of October."

Dr. Skinner described his trip to Europe, giving a detailed account of the Tring Museum.

Mr. Laurent stated that, although *Ligyryus gibbosus* DeG., as well as *Chalepus trachypygus* Burm., were both common species of Coleoptera and were often numerous around the electric lights, he had never seen them in such great numbers as they were this year on the nights of June 6 and October 8 at Anglesea, New Jersey; on both of these occasions they were flying around by the hundreds.

Mr. Kaeber exhibited a large female *Vespa crabro* Linn. (Hym.) found at Darby, Pennsylvania, October 5, 1912, in hibernation. Mr. Daecke said he had taken it in New Jersey but had never seen this European species from this State before. Adjourned to the annex.

GEO. M. GREENE, *Secretary*.

IN MEMORIAM.

Frederick Blanchard.

(Portrait, Pl. II)

Frederick Blanchard, well known to students of the Coleoptera of North America, and dearly loved by all of us who knew him, died at his late home in Tyngsboro, Mass., on November 2, 1912.

He was the son of Cornelius Blanchard and Sarah Sherburne Blanchard and was born August 20, 1843, at Lowell, Mass. He was engaged in the banking business at Lowell from boyhood until his retirement about twelve years ago, at which time he had been cashier of the Prescott National Bank of Lowell for several years.

On the last day of the year 1874 he married Martha Louise Dow, of Exeter, N. H., who survives him. They had no children but adopted a son, George, who was drowned when 24 years of age, in March, 1904.

Mr. Blanchard was a loyal citizen of his township and active in promoting its welfare. He was treasurer of the Village Improvement Association of Tyngsboro for many years, and he was also much interested in the Littlefield Public Library, to which he made a bequest of \$2000.

The magnetic personality of this man at once asserted itself in his delightful letters. These letters, imparting without reserve all his rich fund of entomological and other knowledge on every subject of discussion, and full of helpful suggestions and keen observations, soon came to be awaited with eager expectation, and were enjoyed with the greatest satisfaction. For he was a man who entered with enthusiasm into the interests of his friends and correspondents, and assisted them in their studies in every possible way, whatever the genus, or family, or group which might be the subject of their investigations.

His letters were in fact the principal medium of making

known to other entomologists his valuable observations and discoveries, as only a few of these appeared in print. His table of the species of *Canthon* and *Phanaeus* (Trans. Am. Ent. Soc., Vol. XII, 1885) and the revision of the genus *Cardiophorus* (Trans. Am. Ent. Soc., Vol. XVI, 1889) are the most important of his printed papers. Of the last named genus he described twelve new species.

Though beset by many misfortunes of late years, and himself an invalid for more than a year preceding his death, his entomological interest was keenly maintained up to the very end of his life, and he had practically finished only a few months ago a paper on the genus *Evarthrus*. This will probably be put together and published by his close and intimate friend and protégé, H. C. Fall.

In June, 1901, with keen expectation, the writer journeyed for the first time to Lowell, and then rode on the trolley eight miles or so up the Merrimac River to Tyngsboro, to enjoy the hospitality of the Blanchard home, which, though close to the Nashua Road, was completely hidden from it by a fine grove of pines. This was the haven to which Mr. and Mrs. Blanchard moved about the time of his retirement from the banking business, and here, in their comfortable home surrounded by the fields and meadows, they loved to entertain again and again all of us who made the pilgrimage thither. There was a perfect comradeship between man and wife which impressed us all, and their guests at once felt very much at home. We were escorted to all his famous collecting grounds, and we reveled in the treasures of his wonderful local collection, his excellent library and most of all, we took delight in the great privilege of contact with his simple and kindly personality.

Mr. Blanchard's collection, though a large one, is primarily and essentially one of New England species, very largely collected through the thorough and untiring efforts of his own eyes and hands. Like Mr. Schwarz he possessed an instinct for completely bringing to light the fauna of any locality which he visited, and, again like Mr. Schwarz, his beetles were

most neatly and beautifully mounted, suited for the minutest examination, and every family was carefully studied and its representatives accurately determined, or their names verified, by himself.

Undoubtedly Mr. Blanchard's greatest service for students of North American Coleoptera was performed in his painstaking study and interpretation of the Le Conte types for many friends, themselves unable to make the trip to Cambridge. He was a zealous admirer of Dr. Le Conte, and the Le Conte collection at the Harvard and University Museum of Comparative Zoology he understood perfectly, and he loved it too. He was a constant visitor to Cambridge, and in 1911 Harvard honored him and herself, by enrolling him in its catalogue, as Associate in Entomology of the University Museum.

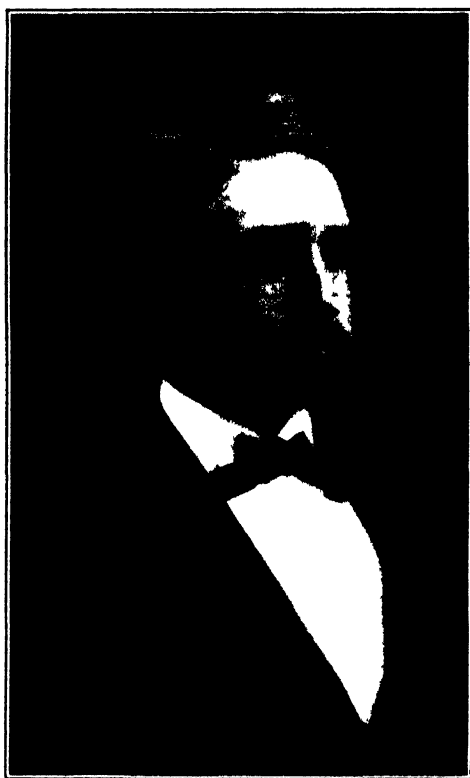
He bequeathed his collection to Harvard, and it is indeed most appropriate that this collection of his own is to be placed beside that of Le Conte which he knew and loved so well.

JOHN D. SHERMAN, JR.

The daily newspapers announce the death of DR. WILLIAM ARMSTRONG BUCKHOUT, Professor of Natural History, 1871-81, and of Botany and Horticulture since 1881 in Pennsylvania State College, on December 3, 1912. He was born in Oswego, New York, December 26, 1846, and graduated from the College in which he subsequently became a professor in 1868. He wrote several articles on economic entomology in the Reports of the Pennsylvania Agricultural Experiment Station and of the State Board of Agriculture for 1889, 1892 and 1893, and contributed notes on insects to various American journals of earlier years.

The deaths of W. F. KIRBY, in England, and W. G. WRIGHT, in California, are also announced and notices of their work will appear in a later number.

The News for December, 1912, was mailed December 4, 1912.



FREDERICK BLANCHARD.

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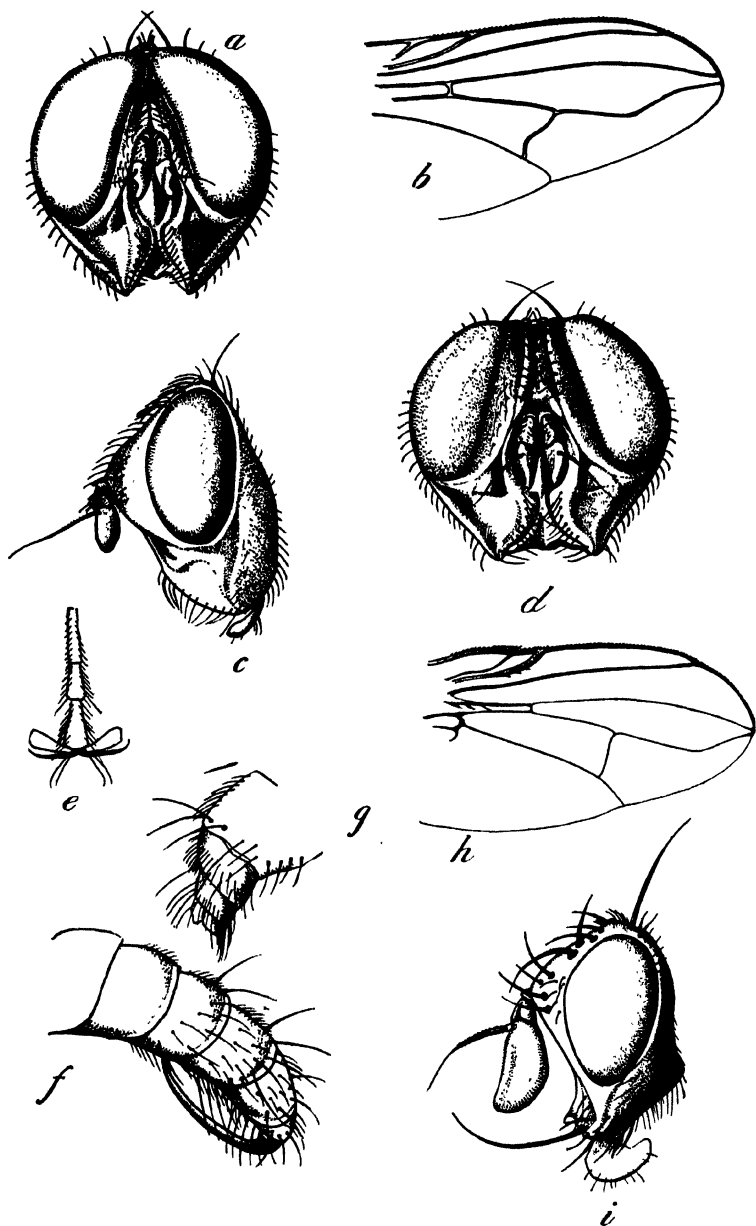
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ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXIV.

FEBRUARY, 1913.

No. 2.

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New North American Tachinidae (Dipt.).

By W. R. WALTON, Bureau of Entomology, Washington, D. C.*

(Plate III)

The first form described below adds a new genus and species to the small aggregation of Muscoids known to be parasitic on beetles of the genus *Lachnosterna*.

The members of this small group, although rather widely separated in the existing artificial classifications, are to some extent similar in habitus, especially as regards the facies.

The front is produced, the antennae and eyes small, the cheeks wide and the vibrissae placed considerably above the front edge of the oral margin. These peculiarities are most marked in the genus *Microphthalmus*. It seems probable that these parasites of *Lachnosterna* are nocturnal or at least crepuscular in habit, as in the genus *Pyrgota* of the Ortalidae which is also parasitic on *Lachnosterna*. In the latter group there is a remarkable similarity in the conformation of the head to the Muscoid parasites of the "may beetles."

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Eutrixoides n. gen.

Face on the lower half of its sides bare. Antennae reaching about half way to oral margin, vibrissae weak, cruciate, far above oral margin. Occiput strongly convex. Frontals do not extend below base of second antennal joint, arista microscopically pubescent. Horizontal diameter of the occiput above the neck less than one-half that of the eye, head at vibrissae noticeably shorter than at base of antennae. Sides of face at narrowest part, one-third to one-half as wide as median depression. Penultimate joint of arista at most only slightly longer than wide. Palpi subcylindrical, less than one-half as wide as proboscis. Fourth vein entire, apical cell open, ending close to extreme wing tip. Sternopleural bristles two, dorsocentrals variable. Inner vertical macrochaetae cruciate, outer verticals merged with the cilia of posterior orbit, all macrochaetae of face and front weakly developed. Abdomen without ventral carina. Ovipositor horny, flattened, exposed, doubled forward under abdomen, nearly one-half as long as abdomen. Male without subanal appendages.

At first glance this form seems to fall naturally to *Eutrixia* Coq., but the remarkable development of the ovipositor necessitates the erection of a new genus for its reception.

Eutrixoides jonesii nov sp. (Pl. III, figs. a-f.)

Length, 7 to 8 mm. Habitat, Anasco, Porto Rico. General appearance to naked eye, slender, brownish gray, nowhere shining. Legs rather long, wings slightly brownish.

Microscopic description: Male, front and ocellar triangle light brown, vitta almost linear immediately before the ocelli. Parafacials cinereous, a narrow cinereous line extending therefrom upward along inner margin of eyes to vertex. Antennae entirely clear ferruginous yellow, arista slender, incrassated only at extreme base, microscopically haired. Cheeks yellowish with whitish reflections. Palpi and proboscis yellow.

Thorax yellowish gray, pollinose, opaque. A distinct oval black spot surrounds each of the last two anterior dorsocentral bristles, inner longitudinal vittae distinct, black, extending back beyond suture, space included between them darker than surrounding surface. Outer longitudinal vittae distinct, expanding into smoky elongate spots extending from humeri nearly but not quite to postalar callus. Scutellum yellowish gray pollinose, sides brown.

Abdomen opaque brown, first segment as long as, or longer than, second, with a narrow pale line along posterior borders of all segments. Slightly yellowish gray pollinose on dorsolateral bases of all segments when viewed from rear. Macrochaetae weak, no median discal or marginal macrochaetae on 1st or 2nd segments, usually a weak apical pair on 3rd segment, 4th segment with discal but no marginals.

Wings tinged with brown, long, somewhat pointed, apical cell open in margin and entering costa close to extreme wing tip. Squamae concolorous with wings.

Coxae yellowish, femora brown, knees yellow; tibiae and tarsi yellowish, densely clothed with short black hairs. Claws of front feet as long as last tarsal joint.

This sex is easily distinguishable from the male of *Eutrixia* by its much narrower front and face.

Female: Front at narrowest part about one-half eye width. Ovipositor exposed, horny, slightly curved, clear brownish and doubled forward beneath abdomen. Otherwise this sex closely resembles the male.

Type.—A female deposited in U. S. National Museum, Washington, D. C. Four specimens, two of each sex, reared from adult beetles of the genus *Lachnosterna* (sp?) collected at Anasco, Porto Rico, May 14-16, by Mr. T. H. Jones, in honor of whom the species is named.

***Chaetophleps crassinervis* n. sp.** (Pl. III, figs. h, i.)

Minute, opaque grayish, wings hyaline. *Facies* resembling *Plectops melissipodes* Coq. Front opaque cinereous, slightly wider than either eye, sides parallel, parafacials almost linear, facial depression as wide as either eye, face entirely cinereous. Vertical bristles stout, almost as long as eye-height, curving backward. Fronto-orbitals three, the lowest stronger, upper two close together. Frontals in a single row descending below the base of second antennal joint. Several proclinate coarse black hairs between frontals and margin of eye opposite base of antennae. Lower half of face bare. Antennae entirely black, minutely pubescent, descending to or slightly below oral margin, second joint short, third joint largely developed, straight on front edge, posterior edge convex, at widest part fully one-half as wide as either eye. Penultimate joint of arista scarcely longer than broad, arista pubescent on its basal half and incrassated nearly to the middle. Vibrissae inserted on the oral margin, stout, very long and cruciate, three or four bristly hairs above them on vibrissal ridges, remainder of ridges bare. Lower part of occiput produced backward somewhat as in *Thryptocera*. Proboscis short, yellow, palpi slender, black.

Thoracic dorsum ash-gray, opaque, inner vittae brownish fading out abruptly at suture. Outer vittae expanded into blackish triangles and ceasing immediately before suture. A circular blackish stain surrounds bases of all dorsocentral macrochaetae. Posterior dorsocentrals two or three, some large bristly hairs scattered among ordinary vestiture of dorsum. Scutellum with three pairs of marginals, apical pair absent. Hairs of disc gradually increasing in strength toward apex where the outermost may be termed macrochaetae.

Abdomen ovate, bearing only marginals on all segments, broadly cinereous on bases of segments two, three and four, remainder of abdomen black, almost shining.

Legs stout, black, middle tibiae with a stout bristle on front side near the middle. Sternopleural macrochaetae four, the upper pair very stout, the lower quite weak.

Wings broad, hyaline, first vein incrassated on its apical third where it bears three or four bristles, third vein bristly nearly half way to small cross vein, apical cell open, ending in extreme tip of wing.

Type.—A female collected by the author at Hyattsville, Maryland, deposited in U. S. National Museum, Washington, D. C.

The species above described is referred to *Chaetophleps* merely because it runs out there in Mr. Coquillett's key to the genera. It cannot be placed in either *Plectops* or *Thryptocera* because the penultimate joint of the arista is not elongated, although its habitus indicates conclusively a close affinity with these forms.

It seems probable that a separate genus will eventually have to be erected for this species; in the meantime it would be folly to do so upon the unique type.

EXPLANATION OF PLATE III.

Eutrixoides jonesii, n. sp.

a, front view of head, male.

b, wing.

c, side view of head, female.

d, front view of head, female.

e, front tarsus of male.

f, lateral view of abdomen, female.

g, *Eutrixa exilis* Coq., tip of abdomen, female.

h, *Chaetophleps crassinervis* n. sp. wing.

i, *Chaetophleps crassinervis*, head.

Fragments on North American Insects—III.

By A. A. GIRAULT, Nelson (Cairns), North Queensland.

1. On Herbaceous Swell-galls.

Some time in 1902 I noted the fact that the swellings or galls occurring on the stems of various plants always contain stationary larvae; that is, the larvae remain in one particular spot, which would indicate constant irritation as a possible cause. It is a noteworthy fact that stem-boring larvae seldom cause these formations.

2. The Dung Beetle, *Canthon laevis* (Col.)

Two round, compact balls of cow dung, resembling a medium sized marble, were found June 28, 1902, at Blacksburg, Virginia, under a fence rail lying over moist soil; they were buried to the level of the earth. Each measured five-eighths of an inch diameter. One contained an egg, but the other was simply nothing but dung. The egg was not central and is remarkably large, yellowish in color and with a varnished appearance like the integument of elaterid larvae, yet soft and easily crushed. It is almost gourd-shaped. Two other balls obtained on June 30 were opened on July 3; one was empty, the other contained a large grub in a perfectly smooth cell. The ball was patched and buried into moist soil; the larva subsequently pupated on July 21; ten days later the pupa commenced to turn brownish and the adult appeared on August 3. The beetles were still laying eggs on July 10.

This short, compact, black-brown scarabaeid is the common dung-rolling species of southwest Virginia, but I am not sure that I have identified it correctly.

3. *Sanninoidea exitiosa* (Say) (Lepid.).

A female of this species was observed depositing eggs on the trunk of a peach tree on September 15, 1902, about 11.30 a. m., at Annapolis, Maryland. About six eggs were deposited within four minutes.

4. Notes on the Occurrence of *Euchaetias egle* Drury (Lepid.).

A larva of this species was taken from milkweed at Blacksburg, Virginia, July 14, 1902. It was fed and four days later, presumably, entered the soil of the rearing-cage. The cocoon

was found on July 22 upon the surface of the soil, where it was very difficult to see. It was composed almost entirely of the hairs from the caterpillar's body, the black ones predominating. Its exterior was covered with particles of dust and twigs. The moth emerged early in the morning of August 7. On August 27, 1902, in the same locality it was noted that the caterpillars of this moth were very numerous and in different stages of development. The milkweed plant was being frequently stripped of its foliage by them. They are gregarious, resting in clusters. A colony of the larvae obtained during the first few days of September pupated on the fourth of that month in a mass on the paper forming the bottom of a bell-jar under which they had been confined. The cocoons were clinging together and, when handled, hundreds of the hairs of which they were constructed entered the hands like so many prickles from a cactus; they cause the tender portions to itch. The cocoon adheres closely to the pupa, which shows no sign of life when handled.

5. **Miscellaneous Notes on *Malacosoma americana* (Fabricius).
(Lepid.).***

The cocoons of this species are composed: (1) of an outer layer of loose folds of silk, (2) a middle layer, compact, and (3) an inner layer still more compact, the silk finer. They are covered with a golden-yellow, or sometimes whitish, powder. The pupae are more or less covered with a fine white powder.

From cocoons collected May 29, 1902, and kept in the laboratory, several moths emerged on June 9 and five others on June 13. On June 10 a few moths were observed in the field. During the night of June 12-13 four egg masses were deposited by the moths in the laboratory and seven had been obtained by June 21, when moths were still emerging. Emergence continued until June 30, or for a period of at least as long as a month. Although the larvae leave the nest and crawl to the ground to construct their cocoons in the grass, under fence rails, logs, boards, stones and so on, still a few use the nest for that purpose as well as the crevices of the bark of the

* See also Note 3, page 401, Vol. XXIII.

tree trunk. Cocoons formed in the nest, however, appeared to be due to disease, as usually they were found to contain unhealthy looking pupae.

6. **A Note on *Autographa brassicae* Riley (Lepid.).**

A nearly full-grown larva of this species was found at Paris, Texas, July 5, 1904, feeding upon tobacco. Three days later a cocoon was found in a furrow along the upper surface of a leaf. It was merely a triangular enclosure of fine-spun, white, closely-woven silk, through which the larva was plainly visible. The latter pupated at 12.30 P. M., July 8. On July 13 the chrysalis commenced to change to a brownish color at the wings and the moth emerged during the early morning of July 14, after a pupal stage of about five days, eighteen hours. On August 11, 1904, the larvae were still common on tobacco in a garden, quite badly injuring some of the plants. On July 17 it was noted that the adults were about lights at night in considerable numbers.

7. ***Euptoieta claudia* (Lepid.).**

The very beautiful toy-like chrysalis of this butterfly was obtained at Paris, Texas, October 16, 1904; it became almost black just before emergence, the silver spots in the wings fading considerably. After emergence, I could not force it to take any position other than one, in which the wings could hang down. It was obviously uneasy in any other position.

8. ***Celatoria diabroticae* Shimer (Dipt.).**

A puparium of this species was found clinging to the leaf of a corn plant (Paris, Texas, May 27, 1904) and another in the same position but near the dead body of *Diabrotica vittata*; the latter had one side of the abdomen missing and the elytra. An adult emerged from one of these on May 31, 1904.

9. ***Anisota senatoria* Hubner (Lepid.).**

A colony of the caterpillars of this moth were quite often found late in August, 1902, at Blacksburg, Virginia, clinging to the naked twigs and leaf petioles of oak; they had stripped these latter themselves. But they were found on certain kinds of oak only and never on *nigrum*; they even refused the latter when urged by hunger as I found by experiment. Professor E. A. Smythe, of the Virginia Polytechnic Institute, told me

that he had had the same experience with them. The larvae stripped the leaves to the midrib.

A colony obtained on August 26, 1902, and placed within a rearing cage molted on August 28 in clusters, leaving the shed skins in conspicuous masses attached along the twigs. The pupae were formed in the earth several weeks later.

10. **A Few Fragments on *Anasa tristis* De Geer (Hemip.).**

The following miscellaneous notes were taken at Paris, Texas, in 1904. On June 7, a male of the Tachinid *Trichopoda pennipes* was reared from an adult female *tristis* which had been captured on May 15 and kept in confinement. The puparium of the fly was formed about an inch below the surface of the soil in the rearing jar. The host died on May 23; its abdomen was empty as found by dissection. Mr. C. T. Brues identified the parasitic fly. Its maggot made no visible exit through the body of its host. In seven egg-masses of *tristis* collected in the field from squash plants between May 30 and June 11 there were 27, 13, 12, 20, 18, 29 and 34 eggs respectively; these masses were either on the under or upper surfaces of the leaf, but most of them on the under surface; one mass was on the stem of the plant. A female dissected on June 11 contained in her ovaries 40 eggs, many of which were imperfect and pale; they filled the entire abdominal cavity.

Some eggs deposited by a female early in the morning of June 2 hatched on June 8 about noon, or after a period of about seven and three quarter days; ten eggs deposited at two o'clock of the afternoon of June 20 hatched about noon, June 29, or after eight days, twenty-two hours. A third lot of eggs laid during the night of June 21-22, hatched late p. m., June 30, or after about nine days.

When hatching the nymph of this species rises perpendicularly from the exit hole in the end of the egg; before the apex of the abdomen leaves the latter, the pinkish appendages commence to spread and by the time the abdomen has been extricated, the bug pushes itself from the egg and immediately walks weakly away. The exit-hole is opened merely by pushing aside a shield-shaped lid whose presence is not visible

until a few hours before hatching when it is defined by lines of yellow, punctiform spots. The newly hatched nymphs are red, the abdomen green; the colors of the first stadium are present after about a half-hour.

A female observed depositing eggs on June 20 (in rearing jar) laid one about every minute and a quarter; during the process the tip of the abdomen was rubbed up and down the surface of the leaf for short distances. When the egg was passed the abdomen was lifted, whereupon a knotlike swelling could be seen passing slowly down and out of the oviduct. This was the egg. It was extruded base down and placed on the spot where the abdomen's tip had been rubbing.

In a garden, egg masses of this species were found on the foliage of cotton and watermelon.

11. **Notes on *Hadronotus carinatifrons* Ashmead (Hymen.).**

Females of this egg parasite were observed in the field at Paris, Texas, June 11, 1904, depositing eggs into a mass of the eggs of *Anasa tristis*. The mass of host eggs contained thirty-four individuals; it was kept and the resulting adults of the parasite emerged during the morning of June 28; the non-parasitized host eggs hatched between June 20 and June 23. The *Hadronotus* continued to emerge until July 3.

Adults kept in confinement with fresh lots of host eggs deposited into them, died usually after from twenty-four to thirty-six hours. The ovipositing female straddles over the host egg when depositing into it, the legs usually resting on adjoining hosts; the body is very still, humped, the head and antennae held down, the latter quiet and held against the face or else hanging inert; the posterior legs are extended backward and fixed to the sides of the attacked egg as if pulling, while the whole body at times pulsates almost imperceptibly back and forward. A single egg is deposited into each host and this usually at one end of it, low down, so that the female's body during oviposition is usually inclined upward. After deposition the female usually crawls off a short distance and then returns to the mass of host eggs to recommence.

The perfect embryo of the parasite fills the whole interior of the host egg, which finally darkens.

12. **The Occurrence of *Chalcis ovata* Say in Texas (Hymen.)**

The adults of this species were captured on the following dates at Paris, Texas, in 1904, from a wire screen around a back porch of a residence: March 2, 21, 22, 24 and 30. Up to March 24 there were only a few specimens. Next day they were much more numerous, about twenty specimens; on March 30, nearly two hundred specimens were obtained. On May 7 it was noted that the adults had not been seen for many days and in fact they were not noticed again until October 12, when an adult was found on a cotton leaf in the field.

13. ***Basilarchia archippus* Cramer (Lepid.).**

A nearly full-grown larva of this species was obtained at Blacksburg, Virginia, June 28, 1902, and kept in the laboratory. It was on a willow, upon which it fed by commencing at the outer edge of a leaf and eating in about half-way to the mid-rib, continuing thus until a rectangular piece had been eaten from the margin of the leaf; it then ate out the remaining rectangular leaf portion down to the mid-rib. It feeds jerkily, the head being lowered every time the larva bites.

On the morning of July 2, this larva was found to have constructed a large groundwork of silk, from which it was suspended in preparation for pupation. The chrysalis appeared on the next morning and the adult emerged during the early afternoon of July 8, or after about four and a half days. July 7, 1902, another larva was obtained from willow, full-grown. In the early afternoon of July 8, it was found suspended from a pad of silk preparatory for pupation; the abdomen was curved upward, the thorax humped, the head tucked under. At 3:15 P. M., the same day, an inner squirming motion of the larva was noticed in the form of quick convulsions lasting about twenty minutes, followed immediately by a split of the integument along the thorax; the chrysalis, by alternately lengthening and shortening its body, quickly freed itself from the larval integument.

At this point it accidentally dropped to the ground, a distance of four feet; its skin was broken by the fall. However, though' apparently dead the next day, on July 10 and 15 it had seemingly recovered and turned very dark on July 17. At 8 A. M., July 18 the butterfly was trying to emerge, but did not succeed in doing so. The wound delayed the development greatly, it seems, and finally killed the insect. The hibernacula of this species are constructed of a single willow leaf with its faces folded together and tied there by silk. The hibernating larvae leave them by means of a comparatively large gaping hole at the distal end. In the same locality, chrysalids of this species have been seen in May.

14. **A Record of *Eupelmus reduvii* Howard (Hymen.).**

Seven adults of this parasite, including both sexes, were reared from the eggs of *Arilus cristatus* (Linnaeus) collected at Annapolis, Maryland, December 26, 1903. The parasites emerged at Paris, Texas, April 1-12, 1904. They were identified by William H. Ashmead. The host eggs were on peach.

15. ***Dryocampa rubicunda* (Lepid.).**

An eggmass of this species was found at Blacksburg, Virginia, August 3, 1902, on the under surface of a leaf of maple. They were in a single layer, the mass round in outline, large, concaved. When ready to hatch the eggs are pale, the perfect embryo distinctly visible; the exit-hole is crescentic and on the side over the embryo's head. After desertion, the eggs are transparent, like small capsules of gelatine. The mass contained about forty eggs. On August 6, larvae were present on maple in all stages. One colony had just hatched, another about half-grown, while some appeared to be nearly full grown. These were all in the same tree. The young larvae have black heads, the old ones red, the most striking difference between them. When first hatched the larva is pale yellow tinged with green; head and legs black; the prolegs pale yellow; two small, black hornlike processes are borne

by the second thoracic segment. All of the eggs do not hatch at the same time.

Larvae hatching on August 3, 1902, and kept in confinement molted the first time on August 8, late in the afternoon. The cervical and anal shields are distinct in the second stadium, but less so as the larva ages. The larvae nearly doubled their size in this stadium. The second molt occurred on August 14 and the third on August 21; after the latter, the head became red in most cases—there were a few exceptions. Smaller and younger larvae have been observed which had red heads, but the majority seem to change only after this molt. No more molts were observed. Pupation occurred on September 3 and that stage passed the winter.

Pupation with other larvae was noticed on August 10 and 13.

16. **An Occurrence of *Halisidota tessellata* (Lepid.).**

On July 16, 1902, a pupa of this moth was found under a log; it was of the usual form for its family, but the cocoon was very flimsy. The adult emerged on July 21. On July 9, 1902, several adults were taken in the field.

17. **Certain Cynipid Galls Eaten by Children (Hymen.).**

From conversations with some citizens of Floyd County, Virginia, in June, 1903, and from statements voluntarily made to me by other citizens of Virginia, I have been led to think that there is some foundation for believing that children have a fondness for the taste of oak-apple galls (*Cynips* spp.). A graduate student in the Virginia Polytechnic Institute upon seeing a specimen stated voluntarily that he "used to eat them when a child and that when they were smaller and contained a little worm in the centre." A senior student in the same school also made remarks to the same effect and said also that some of them were sweeter than sugar; he had eaten the larger specimens "as big as a woman's fist."

18. A Note on Ovipositing Females of *Colias philodice* (Lepid.).

At Blacksburg, Virginia, June 30, 1903, in a clover field, I watched females of this common butterfly for two hours in the morning—the sun shining brightly—and they seemed to be flitting about in a frivolous manner, alighting here and there and placing an egg by curving the abdomen up to the spot intended for it. Seemingly, they thus continue, hour after hour, moving ceaselessly and apparently at random, but never failing to pause here and there to leave an egg. The latter becomes pinkish after about twenty-four hours.

19. On *Hyphantria cunea* Drury (Lepid.).

There was found on May 10, 1902, at Blacksburg, Virginia, a female of this species laying eggs upon an apple leaf. On the following day, the moth having been confined, oviposition was completed, the female then dying. The eggs are deposited in an irregular circular mass on the under surface of the leaf, in a single compact layer, and covered with a loose network of gray hairs from the abdomen of the parent moth. They are pale green, nearly the color of the surface upon which they are deposited, circular from above. Their surface is simple, but when seen under a microscope with tubercular projections. By June 4, the larvae from these eggs had grown to nearly a half inch and were then colored like the older larvae.

On June 20 it was noticed that in their nests the larvae in the field were only about a third grown. The second generation of larvae was a quarter of an inch long by the first of September, 1902.

20. Variation in Hibernating Adults of *Megilla maculata* DeGeer (Coleop.).

A large mass of this beetle was found hibernating under a large chip of wood near a stump in a ploughed field near Paris, Texas, February 25, 1904. In several individuals a large mesial portion of the elytra was olive green, changing gradually to the usual pink from its edges. Also many speci-

mens were very pale pink, others light reddish pink. One specimen was wholly dull olive green, with the usual black markings, but a well-marked color variety, nevertheless.

21. **The Threatening Attitude of a Staphylinid (Coleop.).**

While camped at Mountain Lake, Virginia, July 26, 1902, a large species of this family was noticed in a sandy road leading down the mountain; the abdomen was curled over its back as usual. It was walking rapidly and concealed itself under a piece of wood when I approached. Upon moving the hand toward it, the abdomen was suddenly darted out as if to sting; upon closer approach of the hand, the movement was more rapidly repeated and a white forked process suddenly projected from the anus at each movement. The insect was harmless.

22. **The Host of *Anagrus spiritus* Girault (Hymen.).**

Late in March, 1912, I received for identification from Mr. R. L. Webster, Iowa State College of Agriculture and Mechanic Arts, five slides bearing specimens of this species, all labelled "From egg of *Empoasca flavescens*, Ames, Iowa. R. L. W.," and respectively, "Exp. 234. 26 July, 1911," bearing 1 ♂, 1 ♀; "Exp. 208, 12 July, 1911," bearing 1 ♂; "Exp. 235, 27 July, 1911," 1 ♂, 1 ♀; "Exp. 207, 22 July, 1911," bearing 1 ♂, and "Exp. 233, 26 July, 1911," 1 ♂; a total of 5 ♂'s, 2 ♀'s.

I have noticed a mistake in the original description of this species (Entomological News, XXII, May, 1911, pp. 208-209), where it is stated "that the sixth funicle joint is barely longer than the first (p. 208, next to the last and last line); the *second* funicle joint was intended instead of the first; more, the second joint is slightly longer than the first. In the next sentence (running over to the first line of p. 209) we read "whereas in *incarnatus* it is distinctly longer than the first funicle joint by at least a fourth," the *it* referring to the sixth funicle joint, again the first funicle joint should have read the second. The identification of these specimens was not easy and with certainty may have been impossible were it not for the fact that I had specimens of its closest ally, *armatus*

Ashmead, with which to compare it. Thus, in my table of the North American species of *Anagrus* the specimens were easily traced to the section containing *armatus* and *spiritus*, but I could get no closer without scrutiny of the original descriptions. The two species are very closely related, but *spiritus* has more curved and broader fore wings, the latter bearing a line or two more of discal ciliation and with the naked area clearly delimited. These points do not always show in single specimens of either species. Exceeding care must, therefore, be exercised in identifying the closely allied species of these minute *Mymaridae*.

In the Iowa specimens of *spiritus* much of the cephalic portion of the thorax was dusky black, while the abdomen was wholly dark, the pale intersegmental spaces not showing; hence, they resembled the variety *nigri-ventris* of *armatus*.

Mr. Webster (*in litt.*, February 14, 1912,) wrote concerning the specimens of *spiritus*: "These were reared from the eggs of the Jassids, the same being cut out from the leaf where they had been deposited and isolated in vials." The species is recorded in the literature as a probable parasite of the eggs of *Aphis pomi* De Geer, but this definite record of Mr. Webster makes the recorded host still more doubtful. The fore wings of *armatus* are only comparatively like those of *Polynema longipes* (Ashmead); they, in reality, are still much narrower. In another place I show that *spiritus* is a synonym of *armatus*.

The Genus *Brachynemurus* (Neuroptera).

By NATHAN BANKS, East Falls Church, Virginia.

The Myrmeleconid genus *Brachynemurus* in our fauna includes many species which are widely separated in structure from the original typical species. Originally, it included, in our fauna, two closely similar forms; but gradually other species have been added until it is a heterogeneous assemblage. In recent years many new genera have been described from exotic countries, and to keep pace with the present status of genera in the family, I propose to divide our *Brachynemurus* into four groups, which, if they occurred in tropical countries,

would be considered genera, and one of these groups would be divided into two or more genera.

1. Costals with some connecting gradate or cross-veins, labial palpi short; first anal in both wings runs parallel to cubital fork **Brachynemurus**
Costals simple, or forked toward stigma 2
2. Labial palpi greatly elongated; anal in both wings runs parallel to the cubital fork **Scotoleon**
Labial palpi no longer than maxillary or not much so..... 3
3. In hind wing the first anal runs parallel to cubital fork; more or less evident bent line of veins in wing **Hesperoleon**
In hind wings the first anal bends down to margin on reaching cubital fork; the line of bent veins not plain.. **Clathroneuria**

Brachynemurus Hagen.

This genus was described with two species, *B. longicaudus* and *B. nebulosus* (= *ramburi*). Both of these have some of the costals connected by oblique cross-veins. In both wings the first anal runs parallel to the fork of the cubitus for some distance and is connected thereto by several cross-veins. The palpi are short; in the apex of wings the veins are somewhat bent to form the line. In fore wing three cross-veins before origin of the radial sector, in hind wings two before radial sector; the spurs are not, or scarcely, equal to two tarsal joints. There is no comb of bristles on the outer side of coxæ I. Male abdomen very long. *B. tuberculatus* and *B. elongatus* agree with the above characters; also *B. irregularis*.

Type.—*B. longicaudus* Burm.

Hesperoleon n. gen.

Costals simple, or forked toward the stigma; usually three cross-veins before radial sector in fore wing, and two in hind wing; in apex of wings the veins bent more or less to form the line; in both wings the first anal runs parallel to the cubital fork for some distance, and is connected thereto by several cross-veins; spurs rarely more than equal two tarsal joints; coxa I without comb of bristles on outer side; antennæ hardly one-half their diameter apart; labial palpi not elongated.

Type.—*B. ferox* Walk. (*peregrinus* Hagen).

Includes many species, mostly from the West; as *carrizonus*,

brunneus, *yavapai*, *nigrilabris*, *papago*, *sackeni*, *pallidus*, *singularis*, *hubbardi*, *coquilletti*, *abdominalis*, *blandus*, etc.

Clathroneuria n. gen.

Costal cross-veins simple, or forked toward stigma; in apex of wings the veins are not bent to form the line; in fore wing three cross-veins before radial sector, in hind wing two cross-veins before radial sector; in fore wing the first anal runs parallel to the cubital fork for some distance; but in the hind wing the anal bends down to margin when out as far as the cubital fork, and not connected more than once to the cubital fork. Spurs not as long as two tarsal joints; antennæ not one-half their diameter apart.

Type.—*Brachynemurus schwarzi* Currie.

Scotoleon n. gen.

Includes also *B. pusillus*, *barberi*, and *delicatulus*.

In hind wing two cross-veins before origin of the radial sector, in fore wing about four of them. In fore wing the radial sector arises long before the cubital fork; in hind wing about opposite to the fork. In both wings the anal runs parallel to the cubital fork for some distance and connected thereto by several veins; costals simple, except some near stigma are forked. Coxa I without comb of bristles; spurs equal two joints of tarsus. Antennæ nearly their diameter apart; labial palpi very long, the last joint longer than width of the face.

Type.—*Brachynemurus longipalpis* Hagen.

Revised Keys to the Species of Mosquitoes and Mosquito Larvae found in New Jersey (Dipt.).

By HARRY B. WEISS, Assistant to State Entomologist, and
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In 1904, the late Dr. John B. Smith published his admirable report on the mosquitoes occurring within the State, which included a key to the adults and larvae. Since that time, new species have been described and various changes have taken

place in nomenclature and arrangement.

In view of the large amount of extermination work, which is being carried on, and the additional attention which mosquitoes are receiving in New Jersey and other States, it was thought advisable to revise the tables and bring them as near as possible up to date.

TABLE TO DETERMINE THE SPECIES OF ADULT MOSQUITOES.

Series X in which the wings are spotted.

Palpi uniformly dark brown.

Wings with two white spots on the front margin of the wing;
last vein wholly white*Anopheles punctipennis* Say

Wings with four distinct brown spots; last vein wholly dark
brown*Anopheles quadrimaculatus* Say

Three small spots, middle of wing; abdomen spotted with
brown and yellowish white*Aedes discolor* Coq.

Palpi white marked at base of joints; last vein white marked with
three black spots*Anopheles crucians* Weid

Palpi black with white tips.

Wings grayish with distinct white spot in middle; thorax black
with narrow white lines*Aedes signifer* Coq.

Series Y in which the wings are not spotted.

A. in which the feet are white or yellowish-banded.

I. The beak has a more or less distinct white band or ring at
or near its middle.

a. The abdomen has a yellowish stripe down its middle,
and sides of thorax are white below a black edging,

Aedes sollicitans Wlk.

b. The abdomen has no yellowish stripe. Sides of thorax
are not white.

1. A large blackish species with a narrow white band
near the tip of the femur; the tibia white-spotted.

Aedes jamaicensis Theob.

2. A large brown species with a lighter band near the
tip of the posterior tibiae, the latter not spotted.

Coquillettidia perturbans Wlk.

3. A smaller, blackish species, without markings on
femur or tibia.....*Aedes taeniorhynchus* Wied.

II. The beak is without band or ring; uniform in color.

a. The joints of the feet or tarsi are banded or ringed at
base only.

1. An extremely large, brownish black species. Legs fringed with erect black scales,
Psorophora ciliata Fabr.
2. A very large species with very scaly wings, the sides of the thorax and bands of abdomen and feet white*Aedes sylvicola* Gross.
3. Wings thickly clothed with mixed yellow and brown scales. Thorax with broad, brown central stripe. First tarsal segment of anterior legs not banded,
Aedes fitchii Felt
4. A small dark species with lightly scaled wings; the white bands of the feet narrow; those of the abdomen nearly divided in the centre,
Aedes sylvestris Theob.
5. A small brown species with the hind tarsi wholly white*Aedes niveitarsis* Coq.
6. A good-sized brown species, with the bandings yellowish rather than white, those on abdominal segments only a little or not at all notched at the middle; breeds on salt marshes only,
Aedes cantator Coq.
7. Very like the preceding; but the bands of the abdomen and feet are broader and somewhat lighter in color. Breeds only in fresh water areas,
Aedes subcantans Felt
8. Very like the two preceding; but thorax has a central brown stripe*Aedes abfitchii* Felt
- b. The joints of the hind feet at least are white-banded or ringed at both base and tip; while last joint of hind tarsi is usually entirely white.
 1. A good-sized brown species, the thorax without lines or marks, bands of tarsal joints broad,
Aedes canadensis Theob.
 2. A small blackish species, with top of thorax covered with gray hair and a dark line down its centre; bands on tarsi are narrow and white,
Aedes atropalpus Coq.
 3. A medium-sized species, easily recognized by the peculiar golden streaked appearance of thorax,
Aedes dyari Coq.
- c. All of last two tarsal joints and apex of middle joint white.
 1. A large or medium sized species, black with deep purple reflections*Aedes sayi* D. & K.

B, in which the feet are uniform in color, not in any way marked or banded.

I. The thorax is marked in some way, with stripes or spots, or the sides are white or golden brown.

a. Species with longitudinal white or blue stripes.

1. There are two white longitudinal stripes; the species is of moderate size and blackish,

Aedes trivittatus Coq.

2. There is a well-defined broad central white band, and the top of the head is also white; else as before*Aedes serratus* Theob.

3. There is a diffuse white central stripe, not defined as before; a very small blackish species,

Aedes dupreei Coq.

4. There is a central metallic blue stripe; also blue spots. A small dark brown species,

Uranotaenia sapphirina Arrib.

b. Species in which the thorax is yellowish, white or brown, leaving a blackish central stripe or two, usually not sharply defined; all of moderate size.

1. The thorax is yellowish; brownish abdomen with narrow white bands*Aedes pretans* Gross.

2. The thorax is golden yellow. Abdomen almost black, with broad white bands....*Aedes abserratus* Felt

3. The thorax is very dark brown with pale yellowish scales at sides; abdomen with dirty white bands,

Aedes inconspicuus Gross.

4. The thorax is dark brown, with two pale yellowish spots on centre. Abdomen dark brown with white bands*Culex saxatilis* Gross.

5. The thorax is brown; abdomen not banded, with a metallic silvery gray luster; legs cream-colored,

Aedes pallidohirta Gross.

6. The thorax is golden brown; the abdomen not banded; legs black*Aedes aurifer* Coq.

7. The thorax is silvery white at the sides, not extending much on the upper surface, most of which is black; abdomen not banded.

Aedes triseriatus Say

c. Species in which thorax is white-dotted only.

1. There are two small white dots on each side of the middle and a U-shaped white mark at base; the abdomen is banded*Culex restuans* Theob.

- d. Species in which the entire under surface is silvery white or yellowish.
1. A small form having dorsal surface black; stripes on thorax irregular *Wyeomyia smithii* Coq.
- II. The thorax is without marks or ornamentation.
- a. The segments of abdomen are narrowly banded at their bases.
 1. A small dark brown species; abdominal bands wider in middle than at sides except on 7th segment, which usually has a narrow band, broad at sides,
Aedes fuscus O. S.
 2. A moderate-sized brownish species, with the bands of abdomen of moderate width .. *Culex pipiens* Linn.
 3. A somewhat darker, longer-legged species, with very narrow regular abdominal bands,
Culex salinarius Coq.
 - b. The segments of abdomen are narrowly banded at their apices only.
 1. A small, slight, blackish species. . *Culex territans* Wlk.
 - c. The abdomen has no bands or only the merest indications of them.
 1. A uniformly dark brown species of moderate size,
Culex melanurus Coq.
 2. Species having thorax yellowish brown, somewhat polished, with a thin bluish gray frosting,
Anopheles barberi Coq.

TABLE TO DETERMINE THE LARVAE.

- Antennae arising from the sides of head not pendant..... 1
1. No siphon or breathing tube on 8th abdominal segment,
Anopheles.... 2
 - A siphon or breathing tube on 8th abdominal segment 3
 2. Antennae yellowish; tracheal gills moderate in size,
A. punctipennis, *A. quadrimaculatus*
 - Antennae shorter, brownish; tracheal gills short *A. crucians*
 3. Hair tufts on thorax and abdomen simple, sparse or absent... 4
 - Thorax and abdomen with star-shaped or stellate hair tufts,
Uranotaenia sapphirina
 4. Abdomen with four tracheal gills at tip 5
 - Abdomen with two tracheal gills only; a small whitish species with head rounded and thorax subquadrate,
Wyeomyia smithii
 5. Antennae arise from sides of anterior part of head..... 6

- Antennae arise from near middle of sides of head; the mouth brushes forming a club at sides of mouth; a very large species *Psorophora ciliata*
6. The scales of the eighth abdominal segment are separate..... 8
 The scales of the eighth abdominal segment, 5 to 8 in number, are arranged on a band 7
 The scales are replaced by a series of chitinous bars, arranged in a single row 12
7. The anal siphon is very large and stout, dilated centrally; antenna much longer than head, slender with an even outcurve or convexity *Aedes sayi*
 The anal siphon, shorter, stout, dilated nearer the base; antenna nearly straight, slender, shorter than head. *Aedes jamaicensis*
 The anal siphon is short, stubby, not dilated; antenna much longer than the head, very thick medially, bisinuate or with an outward and an incurve or convexity..... *Aedes discolor*
8. The scales are not more than 16 in number and form a small patch 9
 The scales number 20 or more and form a large patch..... 12
9. Anal siphon of moderate length, three times as long as wide or longer 10
 Anal siphon short, less than three times as long as wide..... 11
10. About 12 elongate scales in a single row; 12-16 siphonal spines, each with one moderate-sized tooth, and sometimes a few very small ones below it *Aedes fuscus*
 Scales 10-15, in a partly double row, tapering apically; siphonal spines 14-18, simple or with 2 or 3 teeth *Aedes sylvestris*
 Scales 7-12 in patch; a small translucent species, feeding at bottom; tracheal gills very long and slender..... *Aedes dupreei*
 Scales 6-7 arranged in a curve; tracheal gills long, slender, uniformly tapering *Aedes abserratus*
11. A stout black species, the thorax white-banded; antennal tuft composed of many hairs; tracheal gills very long,
Aedes serratus
 An elongate slender gray species; antennal tuft a single bristle; tracheal gills short *Aedes triseriatus*
 A large, robust, light species; anal siphon bottle-shaped, outer half linear; anal gills slightly longer than width of ninth segment *Coquillettidia perturbans*
12. Anal siphon short, not much more than twice as long as broad. 13
 Anal siphon moderate, from $2\frac{1}{2}$ to $3\frac{1}{2}$ times as long as broad.. 15
 Anal siphon long, not less than 4 times as long as broad..... 21
13. Stout compact larva; antennal tuft of several hairs..... 14

Long slender larva, antennal tuft of 1 or 2 hairs; 25-35 scales in patch; 17-21 siphonal spines with 2 or 3 long teeth at base,

Aedes atropalpus

14. Scales 14-22, with stout apical and slender lateral spines; 13-18 siphonal spines with 2 or 3 small teeth, sometimes simple; fresh water *Aedes trivittatus*

Scales 16-22 with rounded apex and slender lateral spines; 12-16 siphonal spines, with 1-4 small teeth on both sides; head maculate; salt marsh *Aedes taeniorhynchus*

Scales 20-40, with stout apical and slender lateral spines; 16-24 siphonal spines with 1-5 small teeth; head generally immaculate; salt marsh *Aedes sollicitans*

15. Scales rather broad 16
Scales elongate 17

16. Scales 35-40, with 3 stout apical and smaller lateral spines; 16-20 siphonal spines with 1-3 small teeth; head maculate; salt marsh breeder *Aedes cantator*

Scales 25-50, with one very stout apical and slender lateral spine; 16-22 siphonal spines, with 1 or 2 large and 4-6 smaller teeth on basal half; head immaculate; fresh water form,

Aedes subcantans

17. Only the terminal segment with a dorsal plate or ring 18
Last two segments, with dorsal plates; antenna very short,

Aedes signifer

18. Antenna not specially marked or colored 19
Antenna prominent, white at base, dark at tip.... *Aedes aurifer*

19. Moderate sized species 20
Very large larva; scales 28-34, with long apical and slender lateral spines; siphonal spines 17-22 with 4 or 5 large teeth basally *Aedes sylvicola*

20. Scales 25-30, with short apical and very short lateral spines; siphonal spines 16-20, with 1 or 2 teeth at base, 1 usually very large *Aedes pretans*

Scales 40-45, with 5-7 large apical and smaller lateral spines; 16-22 siphonal spines, with usually 1 or 2, rarely 3 or 4 small teeth *Aedes inconspicuus*

Scales 45 (one larva) with small, slender, apical and fine lateral scales; 15-27 siphonal spines with 1-3 large teeth; rust colored marks on thorax *Aedes nivivittatus*

Scales 25-50, with small apical and smaller lateral spines; 16-24 siphonal spines, with 4-5 serrations on basal half; antenna dark at tip *Aedes canadensis*

21. Antennal tuft above the middle.

- Anal siphon of moderate length, sides a little inflated; tracheal gills moderately long *Culex pipiens*
- Anal siphon very long, rather slender, slightly tapering to tip; head narrower than thorax; tracheal gills short,
Culex salinarius
- Anal siphon very long and slender; a little constricted centrally; head as wide as thorax; tracheal gills moderate or long,
Culex territans
- Anal siphon very long, stout; tapering uniformly. Scales about 80 *Aedes dyari*
- Antennal tuft below the middle.
 Scales 24-30, antenna not arising from an offset. *Aedes abfitchii*
- Anal siphon of moderate length, tracheal gills rather long,
Culex restuans
- Anal siphon 5 times as long as widest diameter. Antennae dark at tip *Aedes fitchii*
22. A bronzed brown larva, with rather long moderately stout, black, breathing tube *Culex melanurus*

A new Hesperid Butterfly from Cuba (Lepid.).

By HENRY SKINNER.

Ephyriades cubensis n. sp.

Female. Expanse 49 mm. Primaries black (very dark brown) with three small silvery dots at the outer third of the costa, extending into the wing at a right angle from the costa; below these are one or two silvery dots almost obsolete, and in the disc below the end of the discoidal cell are two other silvery spots, much more distinct. Beyond these, toward the margin, the wing is somewhat lighter in color. Secondaries black and very faintly marked with spots or bands (almost obsolete).

Underside. Primaries as above, with the spots repeated, but more distinctly shown. Secondaries smoky black, interspersed with light brown scales or hairs, that show distinctly under a low power lens.

Body and legs black; pectus and palpi white; antennae black with the tips lighter in color below.

Described from one specimen, from Mr. C. T. Ramsden, taken at La Yberia, twenty miles west of Baracoa, Cuba, September 18th, 1909. Altitude 2000 feet.

The genus to which this species is referred may not be the correct one. To be sure of the proper genus it is necessary to have a specimen of the male sex.

Two new *Otostigmi* from India (Myriop.).

By RALPH V. CHAMBERLIN, University of Pennsylvania,
Philadelphia.

The two new species of *Otostigmus* here described may readily be distinguished from the other known species of the genus bearing spines upon the prefemur of the anal legs by means of the following key. In this key only the more closely related forms are actually taken up; but it is constructed so as to eliminate all others.

- a. Dorsal plates margined from the 21st segment cephalad at least to the eighth.
- b. The three proximal articles of the antennae glabrous or nearly so.
- c. Ventral plates without true longitudinal sulci; at most with shallow furrows or pit-like depressions.
- d. Last ventral plate with the sides parallel and the caudal margin convexly rounded; ventral plates with eight impressions,
O. cuneiventris Poc.
- dd. Last ventral plate with sides converging caudad and the caudal margin straight or incurved.
- e. Prefemur of anal legs without a corner spine at distal end above; ventral plates with two median depressions, one caudad of the other *O. ceylonicus* Haase
- ee. Prefemur of anal legs with a well developed corner spine; ventral plates with a pair of depressions lying one each side of median line and a small median depression at caudal margin *O. simplex* sp. nov.
- bb. Only the 2 1-3 to 2 1-2 proximal articles of the antennae glabrous.
- c. Dorsal plates, excepting at most the first seven, bearing from 7 to 9 longitudinal keels which are serrate or tuberculate.
- d. At most the first 7 pairs of legs with two tarsal spines, the others with 1, or 20th and 21st with none.
- e. Articles of antennae 21; sulci of sternites weak, developed only on anterior 1-3 or 1-2 of plate; 20th legs with no tarsal spine. *O. scaber* Pocock.
- ee. Articles of antennae 17; sulci of sternites strongly developed, crossing the entire plate; 20th legs with a tarsal spine.
O. amballae sp. nov.
- dd. First 18 pairs of legs with two tarsal spines. Head and first dorsal plate chestnut, with the other dorsal plates bluish green *O. insularis* Haase.

Otostigmus amballae sp. nov.

Dorsum brown, olive along middle part of caudal border and in a number of interrupted or broken longitudinal lines or streaks. Head and first dorsal plate somewhat paler than dorsum. Legs testaceous or yellowish; the posterior pairs distinctly ringed with bands of green.

Head shining; showing numerous fine punctae with fewer coarse ones intermixed.

Antennae composed of 17 articles of which the first two are practically glabrous and the third one similarly so at proximal end.

Dorsal plates from the third to the penult inclusive, longitudinally bisulcate, the sulci deep and completely crossing the plates. Plates from about the fifth caudad distinctly margined. All plates excepting the first two and the last one with a low median keel, one each side of this geminated by the sulcus, and two between the sulcus and the lateral margin, these more lateral keels being more or less broken and bearing inconspicuous tubercles along edges; keels most distinct on the caudal segments. First and second plates smooth. All plates punctate. Last plate simply bowed out caudad, the mesal portion of margin rounded, not angular; with a median longitudinal keel extending from the anterior margin caudad a little more than half the length, this keel being followed on the caudal portion of the plate by a conspicuous median furrow; lateral portions of plate smooth or nearly so.

Prosternal teeth 4 + 4; of these the most ectal is much the smallest and the second from mesal line much the largest, the other two being of intermediate size; line of apices of teeth strongly convex; all teeth angular.

Ventral plates from the second to the penult inclusive, deeply longitudinally bisulcate; also with a wider and shallower median longitudinal furrow which is deepest in front of middle. Plates finely punctate and those of caudal half of body tuberculate; the tuberculation becoming more and more conspicuous caudad.

Last ventral plate narrowed caudad, with the sides convex and the caudad margin weakly concave. On caudal half with a distinct median longitudinal furrow which continues cephalad as a pair of finer and less distinct furrows.

Processes of coxopleurae rather long, extending caudad of ventral plate about two-thirds the length of the latter; terminating in four spines or points, and also with a fifth spine on coxopleural margin near caudoectal corner.

At least the first three pairs of legs with two tarsal spines, the others, or all but a few succeeding these, to the twentieth inclusive, with one tarsal spine.

Prefemur of anal legs armed ventrally with an ectal series of 3 spines and a mesal one of 2; in addition with a strictly mesal series of 3 spines increasing in size distad, and along dorsomesal surface a series also of 3 spines, the distal one of the latter being the corner spine at end of joint. Other articles unarmed and smooth.

Length, 38 mm.

Locality.—Amballa, India (Rev. M. M. Carleton coll., 1873). The type is in the Mus. of Comp. Zoology at Cambridge.

Otostigmus simplex sp. nov.

Type specimens at present much bleached from long preservation so that original coloration cannot be definitely ascertained. At present they are brownish, with a pale median longitudinal stripe. Legs yellowish.

Head finely and sub-densely punctate, the punctae being more sparse in the frontal region. A weak median longitudinal furrow midway between sulcus and caudal margin and a more sulciform impression from anterior margin a short distance caudad.

Antennae composed of 18 articles of which the first three are glabrous.

Dorsal plates from the fourth to the penult longitudinally bisulcate. Plates from the 7th or 8th caudad distinctly laterally margined. Finely punctate, but otherwise very smooth, showing no carinae, or at most on some of the caudal plates with a median one obscurely set off by 2 faint longitudinal furrows.

Last dorsal plate with caudal extension sub-triangular, the lateral portions straight or nearly so from corners to median line, the median angle narrowly rounded.

Prosternal teeth 5 + 5; all teeth well rounded and the more mesal ones appearing as mere crenations in the dental plate, the ectal ones better separated and more angular. Process of femuroid of prehensors large; with a single rounded crenulation or tooth on ectal side and two on the mesal.

Ventral plates all finely punctate. Wholly lacking true sulci; but each with a broad longitudinal depression or furrow on each side which does not reach either the anterior or the posterior margin; in addition there is a much smaller median foveola or depression immediately in front of the caudal margin.

Last ventral plate narrowed caudad, the converging sides straight, excepting at ends, where they are convex, caudal margin distinctly incurved. Convex, smooth and without furrows, excepting for a median longitudinal one over the caudal third of length.

Coxopleurae produced beyond the last ventral plate two-thirds to

three-fourths the length of the latter; process terminating in 3 points or spines and with a lateral spine on the ectal margin.

Between 7 and 12 first pairs of legs with the tarsi bearing 2 spines, the others with a single tarsal spine, excepting the penult and anal pairs which have none.

Prefemur of anal legs with a row of 3 strictly ventral spines; along mesoventral edge with a series of 3 spines; and along mesodorsal edge with a third series also of 3 spines, the distal one of the last mentioned being at the corner; the median spine in each series largest. Other joints wholly smooth.

Length, 50 to 55 mm.

Locality.—Not definitely known; but probably India. It is certainly from the Eastern Hemisphere, as shown by the presence of spines on the anal legs. The type specimens are in the Mus. of Comp. Zoology at Cambridge.

Studies Amongst the Coccinellidae, No. 5 (Col.).

A New and Interesting Species.

By F. W. NUNENMACHER, Piedmont, California.

Coccinella bridwelli n. sp.

Color—Shining black throughout, except two small irregular triangular spots on head, anterior angles of pronotum broadly yellow, and the meso-episternum which is whitish yellow. *Form*—Broadly oval. *Head*—Finely and shallowly punctured. *Pronotum*—Finely, closely and more deeply punctured than the head. *Elytra*—Not so closely punctured, but otherwise punctured, the same as the pronotum. *Ventral surface*—A little more coarsely punctured than the elytra.

♂ last ventral segment with large irregular fovea.

Length—♂ 5.50 mm. ♀ 6 mm. *Width*—♂ 4.5 mm. ♀ 4.50 mm.

Type.—♂ ♀ in my collection (and 4 cotypes in Mr. J. C. Bridwell's collection).

Type locality.—Tahquitz valley, San Jacinto Mts., Cal. VII. 17, 1912 (Bridwell).

This pretty species belongs to the *transversoguttata* group on account of its spotted head. I take great pleasure in naming this species for its discoverer, Mr. J. C. Bridwell.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., FEBRUARY, 1913.

The Meetings at Cleveland.

Some twenty-five scientific societies are said to have met in Cleveland in the last days of December and first days of January in conjunction with the Sixty-fourth Meeting of the American Association for the Advancement of Science. To six of these bodies, namely, Section I, Social and Economic Science, of the Association itself, The American Society of Zoologists, The American Association of Economic Entomologists, The Entomological Society of America, The American Association of Official Horticultural Inspectors, and The American Society of Naturalists, papers of an entomological character were contributed, and as the meetings of the six were held in buildings (of Western Reserve University and the Normal School) near together, it was very easy and convenient to pass from one to the other. It was, indeed, necessary at times to choose between two attractive programs, but, even with the loss that this implied, it is a matter for congratulation that the allied interests represented by these associations were, for the greater part of a week, assembled in the same place. Such temporary unions may not always be possible, but it is surely desirable that they should take place whenever facilities equal to those at Cleveland can be had. The two professedly entomological societies met in the Normal School Building, the Economic Entomologists following the Entomological Society

of America, and much of the success of these meetings is due to the kindly aid and supervision of the details, for which we thank our local member, Mr. E. H. Edwards.

Some time must of course elapse before the publication of all the entomological papers read at Cleveland, so we have thought it of interest to our readers to present here a classified list of them with such indications of the addresses of the speakers that workers in the same subjects may know to whom to apply for further information. Abbreviations of the names of the six societies mentioned above denote the body before which each paper was read, either by title or in full.

GENERAL SUBJECTS.—Organization for Effective Work, F. W. RANE, Boston, Mass.; The Arrangement of Material in an Entomological Bulletin, R. L. WEBSTER, Ames, Iowa. (Econ. Ent.) A few experiments in photographing living insects, F. L. WASHBURN, State Entomologist of Minnesota; Notes on insects of a lake beach, HERBERT OSBORN, Ohio State University (Ent. Soc.). Entomological Pioneering in Arizona, A. W. MORRILL, Phoenix, Ariz. (Econ. Ent.). An Entomologist in Costa Rica, Annual Public Address, DR. PHILIP P. CALVERT, University of Pennsylvania. (Ent. Soc.)

GENERAL MORPHOLOGY.—Propharynx and hypopharynx, ALEX. D. MACGILLIVRAY, University of Illinois; Studies on the mouth-parts of *Rhyparobia maderiae* (Blattidae) with a consideration of the homologies existing between the appendages of the Hexapoda, L. B. WALTON, Kenyon College. (Ent. Soc.).

GENERAL PHYSIOLOGY.—Apparatus for Maintenance of Thermal Climatic Conditions, S. J. HUNTER, Lawrence, Kans. (Econ. Ent.). Some facts regarding the influence of temperature and moisture changes on the rate of insect metabolism, T. J. HEADLEE, N. J. Agr. Exp. Station. (Ent. Soc.). Some Results of Studies on Behavior and Starvation of Dermestidae, J. E. WODSEDALEK. (Amer. Soc. Zool.). How Contact Insecticides Kill, G. D. SCHAFER, East Lansing, Mich.; Some Experiments with Roentgen Rays upon the Cigarette Beetle, *Lasioderma serricorne*, A. C. MORGAN and G. A. RUNNER, Clarksville, Tenn. (Econ. Ent.).

REPRODUCTION AND SEX DETERMINATION.—The Offspring of Certain Wing-Mutants X Normal *Drosophila* and Sexual Dimorphism, F. E. LUTZ, American Museum of Natural History. (Amer. Soc. Zool.). Results of Crossing Two Hemipterous Species with Reference to the Inheritance of an Exclusively Male Character, and its Bearing on Modern Chromosome Theories, K. FOOT AND

E. C. STROBELL (Amer. Soc. Natur.) Spermatogenesis in Spiders, T. S. PAINTER; The Life-Cycle and Sex in Thysanoptera, A. F. SHULL, University of Michigan (Amer. Soc. Zool.)

INSECTS INJURIOUS TO PLANTS.—Economic Entomology at the Second International Congress of Entomology, L. O. HOWARD, Washington, D. C.; New Destructive Insects in New York, P. J. PARROTT, Geneva, N. Y.; Results of Experiments in Controlling the Gypsy Moth by removing its favorite food plants, A. F. BURGESS and D. M. ROGERS, Boston, Mass.; Further Data on Heat as a Means of Controlling Mill Insects, GEORGE A. DEAN, Lawrence, Kans.; A City's Attempt to Trap Brown-Tail Moths, C. H. HADLEY, JR., Durham, N. H.; The Sugar Cane Insects of Porto Rico, D. L. VAN DINE, Rio Piedras, C. R.; Notes on the Rice Water-Weevil, *Lissorhoptus simplex* Say., and its Control, WILMON NEWELL, College Station, Texas; The Sugar Beet Leaf-Hopper, E. D. BALL, Logan, Utah; Some Notes on *Laphygma frugiperda* in Porto Rico, THOMAS H. JONES, Rio Piedras, P. R.; Recent Studies on the Weevil and Bud Moth of the Walnut and a Saw fly attacking Blackberry, W. E. BRITTON, New Haven, Conn.; The Introduction, Methods of Control, and Spread of the Mediterranean Fruit Fly in the Hawaiian Islands, and the Danger of Introducing this Pest into the United States, HENRY H. SEVERIN, Madison, Wis. (Econ. Ent., 11 titles). The Disastrous Work of the Mediterranean Fruit Fly and Melon Fly in the Hawaiian Islands, HENRY H. SEVERIN. (Amer. Ass. Off. Hort. Insp.). Peach Stop-back, the work of the Tarnished Plant bug, Controlling the Apple Leaf-Hopper in Missouri, and The Unspotted Tentiform Leaf-miner of the Apple, LEONARD HASEMAN, Columbia, Mo.; The Codling Moth and One spraying in the Hudson Valley, E. P. FELT, Albany, N. Y.; Fall Spraying for the Pear Psylla, H. E. HODGKISS, Geneva, N. Y.; The Success of a Two-Spray Calendar in a Kansas Orchard, H. B. HUNGERFORD, Lawrence, Kans.; Results of the Arsenical Poisoning Investigation, E. D. BALL, E. G. TITUS, and J. E. GREAVES, Logan, Utah; Notes on comparative tests with Zinc Arsenite and Arsenate of Lead, W. J. SCHOENE, Geneva, N. Y.; Arsenical Residues on Fruit, W. C. O'KANE, Durham, N. H.; Injuries following the application of Petroleum and Petroleum products to Dormant Trees, E. P. FELT, Albany, N. Y. (Econ. Ent., 10 titles).

INSECTS INJURIOUS TO MAN AND OTHER ANIMALS.—Role of Economic Entomology in the Conservation of Human Life, DR. L. O. HOWARD, Entomologist U. S. Department of Agriculture, and Permanent Secretary A. A. A. S. (Section I, A. A. A. S.). Annual address of the President, [Insects Transmitting Disease] W. D. HUNTER, U. S. Dept. Agriculture, Washington, D. C. (Econ. Ent.).

Some sources of laboratory material for work on the relation of insects to disease, WILLIAM A. RILEY, Cornell University; Determining the flight of mosquitoes, JAMES ZETEK, Sanitary Commission, Canal Zone. (Ent. Soc.). Mosquito Control Work in Connecticut in 1912, W. E. BRITTON, New Haven, Conn.; Pellagra and the Sand-fly II, S. J. HUNGER, Lawrence, Kans.; The Transmission of Infantile Paralysis by *Stomoxys calcitrans*, a resumé of Observations by Brues & Sheppard and Experimental Work by Rosenau & Brues and Anderson & Frost, C. T. BRUES, Forest Hills, Mass.; The Stable Fly, *Stomoxys calcitrans* L., its Bionomics and Life History, C. GORDON HEWITT, Ottawa, Can.; The Stable Fly, *Stomoxys calcitrans* L., an important Live Stock pest, F. C. BISHOPP, Dallas, Texas. (Econ. Ent., 5 titles). Some anatomical studies of *Stomoxys calcitrans* Linn., C. K. BRAIN, Ohio State University. (Ent. Soc.). A Campaign Against Flies, JEAN DAWSON, Cleveland, Ohio. (Section I., A. A. A. S.). Some external parasites of domestic fowls, G. W. HERRICK, Ithaca, N. Y.; Notes on little known habits of the spotted fever tick, R. A. COOLEY, Bozeman, Mont.; Additional Notes on the Biology of the Rocky Mountain Spotted Fever Tick (*Dermacentor venustus* Banks), F. C. BISHOPP and W. V. KING, Dallas, Texas (Econ. Ent.).

BENEFICIAL INSECTS.—Some natural Enemies of Red Spiders, H. J. QUAYLE, Berkeley, Calif.; Preliminary Review of the Parasites of *Coccus hesperidum* in Calif., P. H. TIMBERLAKE, Whittier, Cal. (Econ. Ent.).

SPECIAL GROUPS. ARACHNIDA.—The Origin of Arachnida in the Light of Palaeontological Evidence, ALEXANDER PETRUNKEVITCH, Yale University (Amer. Soc. Zool.).

THYSANURA.—Notes on the Distribution of *Thermobia domestica* and *Lepisma saccharina*, S. R. WILLIAMS, Miami University (Amer. Soc. Zool.).

ORTHOPTERA.—Notes on Three Common Tree Crickets, P. J. PARROTT and B. B. FULTON, Geneva, N. Y.

PLECOPTERA.—Mating and egg-laying habits of *Perla immarginata* Say., LUCY WRIGHT SMITH, Mount Holyoke College. (Ent. Soc.).

EPEHEMERIDA.—Eggs and egg-laying of may-flies, ANNA H. MORGAN, Mount Holyoke College. (Ent. Soc.).

HEMIPTERA.—Remarks on the Cicadidae with special reference to the Ohio species, PROF. HERBERT OSBORN, Ohio State University; A study in antennal variation, EDITH M. PATCH and WILLIAM C. WOODS, Maine Agr. Exp. Station. (Ent. Soc.). *Schizoneura ulmi* (*fodiens*) distinguished from *Schizoneura lanigera* (*americana*), EDITH M. PATCH, Orono, Maine. (Econ. Ent.). Life cycle and de-

velopment of the Tarnished Plant-bug, *Lygus pratensis* Linn, LEONARD HASEMAN, University of Missouri; The strigil in Corixidae and its probable function, J. F. ABBOTT, Washington University. (Ent. Soc.).

THYSANOPTERA.—Head and mouth-parts of *Cephalothrips yuccae*, ALVAH PETERSON, University of Illinois. (Ent. Soc.).

COLEOPTERA.—The ontogeny of elytral pigmentation in *Cicindela*, VICTOR E. SHELFORD, University of Chicago; Life history and habits of *Trogoderma tarsale*, a museum pest, J. E. WODSEDALEK, University of Wisconsin. (Ent. Soc.).

TRICHOPTERA.—An interesting feature in the venation of *Helicopsyche*, the Mollannidae, and the Leptoceridae, C. BETTEN, Lake Forest University. (Ent. Soc.).

LEPIDOPTERA.—The homology of the body setae of lepidopterous larvae, Y. H. TSOU and S. B. FRACKER, University of Illinois; The anatomy of some lepidopterous pupae, EDNA MOSHER, University of Illinois; The tracheation of the pupal wings of some saturnians, N. L. PARTRIDGE, University of Illinois. (Ent. Soc.).

DIPTERA.—On the biology of *Drosophila ampelophila*, FRANK LUTZ, Amer. Mus. Nat. Hist.; Observations on the biology of a blow-fly and a flesh fly, E. P. FELT, State Entomologist, New York. (Ent. Soc.).

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Eleodes in Minnesota (Coleop.)

During the months of July and August, 1911, while collecting on the low sand hills west of Fergus Falls, Minnesota, I had the good fortune to secure several specimens of *Eleodes tricostata* Say. The beetles were found under boards along the Union Pacific Railway tracks and were quite common. This species I also collected in the latter part of August at Wall Lake, Minnesota, about six miles east of Fergus Falls. Here, also, the region is sandy but the beetles were not so common as at Fergus Falls. This is, I believe, the first record of the occurrence of *Eleodes* in the State.

Blaisdell, in his "Revision of the Eleodiini of the United States" (Bull. 63, U. S. N. M., 1909), says of the sub-genus *Melaneleodes* Blaisdell: "Distributed throughout nineteen States out of the twenty-three west of the Mississippi River. I have no record of specimens from Missouri, Arkansas, Minnesota and Louisiana."

Professor H. F. Wickham (List of the Coleoptera of Iowa, 1909). gives the following Iowa records: *Eleodes suturalis* Say, "Lyon County." *Eleodes tricolorata* Say, "Elma, Ames, Independence; and Lyon, Dickinson, Emmet and Woodbury Counties." The Dickinson County records are based on specimens taken in the vicinity of Lake Okoboji, by B. Shimek, O. W. Rosewall and A. O. Thomas. In this locality the species seems quite abundant.—DAYTON STONER, State University of Iowa, Iowa City, Iowa.

***Andrena dunningi* Ckll. (Hymen.)**

Since this species was described from Connecticut in 1898, a good deal of confusion has arisen concerning it. In ENTOM. NEWS, July, 1907, p. 286, Viereck writes *A. nivalis* Sm., with synonyms *pruni*, *dunningi*, *viciniformis*, *convexa* and *viburnella*. However, in the separate he kindly sent to me, he has in a manuscript emendation removed *pruni*, *dunningi* and *viburnella* from the synonymy of *nivalis*, making *viburnella* a sub-species of *A. perplexa*, and *pruni* a distinct species with synonym *dunningi*. It is certain that *dunningi* is not *nivalis* (the type of which I have seen); they not only differ in their characters, but Dr. Graenicher finds their time of flight is different. The characters of *dunningi* are not those of *pruni*, but the description of *viciniformis* agrees with *dunningi*. I have just received a post card from Mr. Charles Robertson in which he states that his *viciniformis* is identical with *dunningi*; the latter has two years' priority. The insect is well distinguished from *A. pruni* in both sexes, as shown in Robertson's tables, Trans. Amer. Ent. Soc., XXVIII, pp. 190-192.—T. D. A. COCKERELL.

Notes on *Lycaena neurona* (Lepid.).

This species was described from the female sex, in ENTOMOLOGICAL NEWS, vol. 13, p. 15, 1902. I had at that time five specimens that I took to represent both sexes, but I did not dissect out the genitalia to be sure. They came from Doble, California, which place Mr. W. G. Wright in his "Butterflies of the West Coast" describes as follows:—"It is a high mountain valley 6,500 feet in altitude, the northern and eastern sides being bordered by the Mojave Desert. But few forms of butterfly life are present there, but the few which do occur may well be variations of one kind or another. The locality Doble, is at the upper end of Bear Valley, in San Bernardino County, California; the grassy valley is surrounded with pine-clad mountains."

I have recently had a letter from Mr. H. H. Newcomb, of Venice, California, in relation to this species. He took ten males and seven females, last August, at the top of Mt. Wilson, Los Angeles County, Cal., on a little patch of ground one hundred by three hundred feet.

He also says that *Lycaena acmon* of both sexes was flying at the same time, not only at this locality but everywhere else. It seems that the Californian Lepidopterists, including Mr. Wright have taken *neurona* to be merely a variety of *acmon* female. Mr. Newcomb did not share this opinion and sent me a male specimen for examination. In the original lot from Doble there are three males and two females and I also have a female from Pine Mountain Forest Reserve, Ventura County, California. *Acmon* with which the species has been confused, has sexes unlike (antigenetic), while in *neurona* there are no secondary sexual characters. It is a smaller species than *acmon* and may be known by the orange colored neuration which is relatively variable in different specimens.—HENRY SKINNER.

Birds & Butterflies (Lepid.)

During the rainy season in South Africa, the open glades in the forests bordering the rivers are gay with multitudes of brightly colored butterflies of many different species and after a night's rain butterflies of various kinds may often be seen settling in masses around pools of water along wagon roads. Most of these are conspicuously colored, though they are in perfect harmony with the sunlit flowers which spring up at the time of year when they appear. I cannot, however, believe that the need for protection against birds or other enemies has anything to do with the determination of their various colors, as in all my experience (and I have all my life been a close observer of nature) I have never once seen a bird feeding upon butterflies in Africa.—*African Nature Notes and Reminiscences*, by FREDERICK COURTENEY SELOUS, F. Z. S.

Insect Arrow Poison (Coleop.)

Bushmen in Africa. Their bows are very small and weak looking and their arrows are unfeathered, being of light reeds into the ends of which bone heads are inserted. These bone arrow heads are always thickly smeared with poison, which seems to be made from the body of a grub* or caterpillar mixed with gum. At least, in the bark quivers of the Bushmen whose belongings I have examined, I have usually found, besides their arrows and fire sticks, a small bark cylinder closed at one end, in which were the bodies of grubs or caterpillars preserved in gum, which I was told contained the poison they smeared on their arrows.—*Ibid.* SELOUS.

*Perhaps the larva of the Chrysomelid *Diamphidia locusta*; see Wellman, ENT. NEWS, XIX, p. 229, also v. Fürth, Vergl. chem. Physiol. d. niederen Tiere, 1903, p. 365.—ED.

Trichoptera Collected Under Unusual Conditions.

On November 30, 1912, I started at an early hour with two friends for a long "hike" in the mountains near Salt Lake City. At nine o'clock A. M., when we had reached a point several miles up a nearby canyon and were well up on the mountain side, we were forced to turn back by a snowstorm. By the time we had reached the bottom of the canyon and the road which led along the stream, the ground was well covered with fresh snow. As there had been snow and cold weather for some weeks at that altitude (estimated at 6000 ft.) I was not engaged in looking for imagos of Trichoptera, and was much surprised to discover a live one crawling on the snow. It was bottled as a record specimen for late transformation, but another and another was found as we walked along the road until, in a short time, twelve individuals were picked up. As it was still snowing heavily and bade fair to continue all day I decided not to stop to collect more, but to count those seen in passing. A total of thirty-three individuals was thus recorded. All were fresh, as if just emerged, and all were of a single species, *Platyphylax designatus* Walk. I have previously taken single specimens at irregular times, but none so late as this. The majority of the imagos emerge in May and June in Wisconsin, but the time is less regular in the mountain regions, where they emerge at later and later dates as the altitude is greater. Emergence of numbers at so late a date at any altitude in this climate is to me inexplicable. On arrival at the laboratory it was discovered that but nine of the individuals were in the bottle, wet gloves and chilled fingers having doubtless been responsible for some loss while collecting. These nine specimens are all of one sex, all being females—CHAS. T. VORHIES, University of Utah, Salt Lake City, Utah.

The 1912 Swarm of *Aletia argillacea* (Lepid.).

It may be of some interest to have recorded that our annual visit of swarms of *Aletia* (*Alabama*) *argillacea* was not omitted the present season.

During the week ending October 12, the moth was marvelously conspicuous in this neighborhood. Thursday, October 10, I was riding in a trolley car on a North and South line and there were literally hundreds of *argillacea* on the windows on the West side of the car, while but few were to be seen on its East side. This would seem to indicate that the flight was from the West. The fact that all specimens were in excellent condition, as if they had just emerged, makes one reluctant to believe that their flight could possibly have been all the way from the cotton fields.

They were more or less abundant in this vicinity for several days afterwards. I took them both at a light-trap and at sugar. Many

specimens were reported or brought to me for identification from various parts of the county indicating an abundant distribution over many miles of area. Is there a local food plant?—O. S. WESTCOTT, Oak Park, Illinois, Nov. 6, 1912.

The Occurrence of *Leucania unipunctata* (Haworth) on Sugar Cane in North Queensland (Lepid.).

The characteristic caterpillars of this species were observed damaging young cane and corn plants at Nelson, North Queensland, in June, 1912. The larvæ were in only a few cane and corn fields where they caused considerable damage. The young leaves of both cane and corn were eaten off near the base, but the other leaves were also eaten. During the day the larvæ remained concealed in the crevices of the leaves, but in dull cloudy weather a few were observed feeding. It was noticed that whereas both young and old corn plants were attacked, only cane plants under three feet high were damaged. Parasitic wasps in large numbers were seen in the infested fields. In one small corn field in the township of Nelson, the larvæ stripped almost every leaf from the plants and the whole field was practically ruined. This was an isolated case.

On June 24, 1912, twenty-three larvæ were taken from a corn field and placed in jars with cane leaves and a little earth. They had pupated by June 30. The moths commenced to emerge on July 10 and continued to emerge until July 23, fifteen of the twenty-three reaching maturity. The remaining pupae were kept for three weeks longer but nothing came from them.

On June 28, twenty-two large larvæ were taken from a cane field and were kept in the same manner. They had pupated by July 3. The adults began to emerge on July 15 and continued up to July 23. Of the twenty-two larvæ taken, twelve reached maturity. No insects emerged from the remaining ten.

The average daily temperature from June 24 to July 23 was 21.16 deg. C. (70.1 deg. Fahr.)—ALAN P. DODD, Entomological Laboratory, Sugar Experiment Stations, Mackay, Q.

***Eustypiura rodriguezi* (Hym.)**

When publishing this Guatemalan Chalcidid recently in the News, I knew only that it had been bred from a lepidopterous insect. Mr. Juan Rodriguez now sends me an account of the host, sufficient to show that it is a Psychid, probably a species of *Oiketicus*. It may well be that the remarkable abdomen of *Eustypiura* is for the purpose of reaching Psychid larvæ in their cases, and that the members of the genus will be found to be all parasitic on Psychidæ.—T. D. A. COCKERELL.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues, which are generally dated the year previous.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

7—Journal, New York Entomological Society. 7—U. S. Department of Agriculture, Bureau of Entomology. 8—The Entomologist's Monthly Magazine, London. 9—The Entomologist, London. 10—Nature, London. 11—Annals and Magazine of Natural History, London. 18—Ottawa Naturalist. 21—The Entomologist's Record, London. 22—Zoologischer Anzeiger, Leipzig. 24—Berliner Entomologische Zeitschrift. 40—Societas Entomologica Zurich. 47—The Zoologist, London. 50—Proceedings, U. S. National Museum. 55—Le Naturaliste, Paris. 60—Anales, Museo Nacional de Buenos Aires. 64—Annalen, K. k. Naturhistorischen Hofmuseums. Wien. 79—La Nature, Paris. 84—Entomologische Rundschau. 86—Annales, Societe Entomologique de France, Paris. 89—Zoologische Jahrbucher, Jena. 97—Zeitschrift fur wissenschaftliche Zoologie, Leipzig. 106—Internationale Entomologische Zeitschrift, Guben. 172—The American Museum Journal, New York. 175—Aus der Natur, Berlin. 180—Annals, Entomological Society of America. 184—Journal of Experimental Zoology, Philadelphia. 186—Journal of Economic Biology, London. 187—Jahrbucher des Nassauischen Vereins fur Naturkunde, Wiesbaden. 189—Pomona Journal of Entomology, Claremont, Cal. 191—Natur, Munchen. 195—Bulletin, Museum of Comparative Zoology at Harvard College, Cambridge, Mass. 198—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. 201—Memoires, Societe Entomologique de Belgique. 216—Entomologische Zeitschrift, Frankfurt a. M. 246—Bulletin International, Academie des Sciences de Cracovie. Ser. B. Sciences Naturelles. 251—Annales Sciences Naturelles, Zoologie, Paris. 269—Memoirs, Department of Agriculture in India. Entomological Series, Calcutta. 274—Archiv fur Zellforschung, herausgeben von Dr. R. Goldschmidt Leipzig. 308—Journal, College of Agriculture, Imperial University of Tokyo. 311—La Science au XXe Siecle, Paris. 322—Journal of

Morphology, Philadelphia. **327**—Scientific Memoirs by Officers of the Medical and Sanitary Departments of the Government of India (new ser.), Calcutta. **346**—Fauna Exotica. Mitteilungen aus dem Gebiete der exotischen Insektenwelt, Frankfurt am Main. **355**—Smithsonian Institution Report, Washington, D. C. **368**—The Monthly Bulletin of the State Commission of Horticulture, Sacramento, Cal. **381**—Experiment Station Record, Washington, D. C. **397**—Pfluger's Archiv für die Gesamte Physiologie des Menschen und der Tiere. Bonn. **409**—Journal of the Academy of Natural Sciences of Philadelphia, 2nd Series. **410**—Journal of the Washington Academy of Sciences. **411**—Bulletin of the Brooklyn Entomological Society. **412**—Porto Rico Agricultural Experiment Station, Mayaguez. **413**—Report of the State Entomologist of Minnesota, St. Anthony Park.

GENERAL SUBJECTS. Anon.—Economic entomology, **387** xxvii, 549-565. **Bryant, H. C.**—The number of insects destroyed by western meadowlarks, **86**, xxxvi, 873-875. Some insects and other arthropods in the diet of the western meadowlark, **189**, iv, 807-809. **Burling, L. D.**—The nomenclature of types, **410**, ii, 519-520. **Cameron, P.**—Obituary, **8**, 1913, 20-21. **Drzewina, A.**—Distribution géographique des animaux, **311**, x, 90-96. **Fassl, A. H.**—Tropische reisen IV. Muzo, das land der schonsten smaragde und schmetterlinge, **84**, xxix, 147-149 (cont.). **Hunter, Pratt & Mitchell.**—The principal cactus insects of the United States, **7**, Bul. 113, 71 pp. **Kirby W. F.**—Obituary, **8**, 1913, 19-20; **9**, 1912, 351-352; **21**, 1912, 314-317 **47**, 1912, 466-468; **166**, vi, 251-252, 257 (cont.). **Lehmann, T.**—Entomologische streifzuge in Nord-Amerika, **346**, ii, 66-67 (cont.). **Long C. W.**—Co-operation with the New York Entomological Society **172**, xii, 314-316. **C. M.**—By the Way (note, on nomenclature, and on the "humming in the air"), **9**, 1912, 340-341. **Mallock, A.**—Note on the iridescent colors of birds and insects, **355**, 1911, 425-432. **Mason, C. W.**—The food of birds in India, **269**, iii, 371 pp. **Meissner, O.**—Nomenklaturfragen, **216**, xxvi, 137-138, 141-142, 145-146. **Stiles, C. W.**—Suggested amendments to the International Code of Zoological Nomenclature, **22**, xli, 37-47. **Washburn, F. L.**—Grasshoppers and other injurious insects of 1911 and 1912, **413**, xiii, 114 pp.

Champion, G. C.—Coleoptera, etc., in bromeliads, **8**, 1913, 2-7.

ARACHNIDA, ETC. **Fulinski, B.**—Ein beitrage zur keimblatterbildung der araneinen, **246**, iii, 769-790. **Hilton, W. A.**—Sensory setae of tarantula and some of its relatives, **189**, iv, 810-817.

Chamberlin, R. V.—The Henicopidae of America, north of Mexico, **195**, lvii, 1-36. **Strand, E.**—Bemerkungen zu dem katalog amerikanischer spinnen von Alexander Petrunkevitch, **187**, lxxv, 171-177.

APTERA AND NEUROPTERA. Claude, D.—La naissance d'une libellule, **78**, xl, 417-419. Matheson, R.—The structure and metamorphosis of the fore-gut of "*Corydalis cornutus*," **322**, xxiii, 581-624. Miyake, T.—The life-history of "*Panorpa klugi*," **306**, iv, 117-139. Philpitschenko, J.—Beitrage zur kenntnis der Apterygoten. III. Die embryonalentwicklung von "*Isotoma cinerea*," **97**, ciii, 519-660. Russell, H. M.—The red-banded thrips (*Heliothrips rubrocinctus*), **7**, Bul. 99, pt. 2.

ORTHOPTERA. Burr, M.—Collecting O. in the Caucasus and Transcaucasus, **21**, 1912, 297-302 (cont.). Shelford, R.—The oothecae of Blattidae, **21**, 1912, 283-287. Turner, C. H.—An experimental investigation of an apparent reversal of the responses to light of the roach (*Periplaneta orientalis*), **198**, xxiii, 371-386.

Burr, M.—Die Dermapteren des K. K. naturhistorischen Hofmuseums in Wien, **64**, xxvi, 62-108.

HEMIPTERA. Browne, E. N.—A study of the male germ cells in Notonecta, **184**, xiv, 61-122. Girault, A. A.—Preliminary studies on the biology of the bedbug (*Cimex lectularius*). II. Facts obtained concerning the duration of its different stages, **186**, vii, 163-188. Hagemann, J.—Biologie der bekanntesten wasserwanzen, **191**, iv, 151-152. Johnston, C. E.—The internal anatomy of "*Icerya purchasi*," **180**, v, 383-390. Riley, W. A.—Some remarkable discoveries regarding a common household insect, **86**, xxxvi, 865-866.

Davis, Wm. T.—A new Cicada from Plummer's Island, Maryland, **411**, viii, 2-4. Essig, E. O.—Aphididae of southern California, **X**; **189**, iv, 758-797. Kell, D.—The "longulus" scale (*Coccus hesperidum* var. longulus), **189**, iv, 798-800. Van Duzee, E. P.—"Synonymy of the Provancher collection of Hemiptera," **55**, xxxix, 76-80.

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Grossbeck, J. A.—Miscellaneous notes and descriptions of North American Geometridae, **6**, xx, 282-292. **Hampson, G. F.**—Descriptions of n. sp. of Pyralidae of the subfamily Pyraustinae (cont.), **11**, x, 557-573. **Mabille et Boulet.**—Essai de revision de la famille des Hesperides, **251**, xvi, 1-159. **Oberthur, C.**—Etudes de lepidopterologie comparee. Fasc. VI, 355 pp. **Woodworth, C. W.**—Check list of California insects IV. Lepidoptera, **368**, i, 941-948.

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Alexander, C. P.—A revision of the genus *Brachypremma* (Tipulidae), **6**, xx, 225-236. New neotropical Tipulinae, **180**, v, 343-366. On the tropical American Rhipidiidae, **411**, viii, 6-17. **Andries, M.**—(See above.) **Brethes, J.**—Sobre la "Brachycoma acridiorum," **60**, xxii, 441-446. Description de un nuevo genero y especie nueva de Chironomidae, **60**, xxii, 451-453. **Enderlein, G.**—Dipterologische studien. I. Die dipteren-familie Pantophthalmidae, **22**, xli, 97-118. **Felt, E. P.**—Studies in Itonididae, **6**, xx, 236-248. The gall midge fauna of western North America, **189**, iv, 753-757. **Landrock, K.**—Zur monographie der gattung "Boletophila," **24**, lvii, 33-51. **Townsend, C. H. T.**—Descriptions of n. gen. and sp. of muscoid flies from the Andean and Pacific Coast regions of South America, **50**, xliii, 301-367. **Welch, P. S.**—(See above.)

COLEOPTERA. **Backman, E. L.**—Der osmotische druck bei einigen wasserkäfern, **397**, cxlix, 93-114. **Von Dalla Torre, K. W.**—Coleopterorum catalogus. Pars 49. Scarabaeidae: Melolonthinae, 135-290. **Gee & Lathrop.**—Death feigning in "Conotrachelus nenuphar," **180**, v, 391-399. **Ghosh, C. C.**—Life histories of Indian insects (*Oryctes rhinoceros*, *Rhynchophorus ferrugineus*), **269**, ii, 193-217. **Kolbe, H.**—Die tiergeographischen verhältnisse der Scarabeidengruppe der Phaeochroinen, **84**, xxix, 153-157 (cont.). **Nakayama, S.**—"Chilocorus simili" and its relation to scale insects in Japan, **368**, i, 932-936. **Wodsedalek, J. E.**—Life history and habits of "Trogoderma tarsale," a museum pest, **180**, v, 367-382.

Fall, H. C.—A review of the North American species of Collops, **6**, xx, 249-274. **Gebien, H.**—Neue kaefer aus der familie Tenebrionidae des museums Wiesbaden, **187**, lxxv. 232-248. **Pic, M.**—C. nouveaux de diverses familles, **60**, xxii, 455-458. **Prell, H.**—Revision des Dynastinen-genus "Heterogomphus," **201**, xx, 93-176. **Raffray, A.**—Pselaphides de la Republique Argentine, **60**, xxii, 447-450.

HYMENOPTERA. **Bertoni, A. de W.**—(See below.) **Branner, J. C.**—Geologic work of ants in tropical America, **355**, 1911, 303-333. **Casteel, D. B.**—The behavior of the honey-bee in pollen collecting, **7**, Bul. 121. **Mignault, J. B.**—Les Ammophiles. "Comme au pays de J. H. Fabre," **55**, xxxix, 82-94. **Schneider, K. C.**—Orientierung der bienen, **191**, iv, 148-151. **Sladen, F. W. L.**—Bee with Pollinia attached to its feet, **18**, xxvi, 116-117.

Bartlett, O. C.—The North American digger wasps of the subfamily Scoliinae, **180**, v, 293-340. **Bertoni, A. de W.**—Contribucion a la biologia de las avispa y abejas del Paraguay, **60**, xxii, 97-146. **Ducke, A.**—Die natuerlichen bienengenera Sudamerikas, **89**, xxxiv, 51-116. **Forel, A.**—Formicides neotropiques IV—VI, **201**, xx, 1-92. **Fullaway, D. T.**—Gall-fly parasites from California, **6**, xx, 274-282. **Jorgensen, P.**—Los Crescidos y los H. Aculeatos de la Provincia de Mendoza, **60**, xxii, 267-338. **Schulz, W. A.**—Aelteste und alte H. skandinavischer autoren, **24**, lvii, 52-102.

REVIEW.

TROMBIDIIDAE, By A. BERLESE. Redia, Vol. VIII, fasc. 1^o. June 29, 1912.—This monograph of the so-called "harvest mites" consists of 291 pages, and contains 137 text figures and one colored plate. The numerous genera into which this family has recently been divided are here for the first time clearly defined. The author gives in a few semidiagrammatic figures the principal characters of the different genera. He also follows the excellent practice of tabulating all the important generic characters, and grouping, by means of keys, the different genera into separate tables according to the variations of a single character. By such an analysis the range of structural variations is made clear, and the correlation of these variations is made possible. Thus the natural affinities of the genera being exposed, their natural arrangement follows with ease. Besides, this method enables one frequently to place poorly preserved or mutilated specimens with facility and certainty when it would be impossible to do so by means of a single complicated key which should require the ascertaining of many, if not all, of the generic characters considered.

At the end of the work the various species are arranged into tables according to the countries in which they are found. Also a synonymical table and bibliography are given.

It is unfortunate that some of the common species found in this country are omitted in this work.—H. E. EWING.

OBITUARY.

W. G. Wright.

William Greenwood Wright died at his home on F. Street, in San Bernardino, Calif., on Sunday afternoon, December 1, 1912, at the age of about 83. He had been in apparently good health and spirits for some time past. He was found dead sitting in his chair, a newspaper fallen from his relaxed grasp. The cause was heart failure, and his death must have been an instantaneous and painless one.

He was born near Newark, New Jersey, the exact date not ascertainable; his early education was limited. He was a soldier in the Union Army during the Civil War, and soon after the close of that conflict he must have come to California; where he resided a few years in Los Angeles, and where his only child was born and died in infancy. He went to San Bernardino about 1873, and conducted a planing-mill for many years. About fifteen years ago he retired from business, and spent his time in collecting and gathering material for his book on butterflies. His wife died a number of years ago and he leaves no near relatives. His collection of butterflies and library he has left to the California Academy of Sciences in San Francisco; some other collections are to be sold. Mr. S. B. Parish, the pioneer botanist, a close friend of Mr. Wright and the executor of his estate, has given me the few data pertaining to his life that are now obtainable; he was a recluse in all phases of his life, and the most we have is that indefinable quality which only personal acquaintance can give; and his writings and contributions to science.

Mr. Wright traveled all over the West Coast from Alaska to Mazatlan, Mexico, collecting specimens in various departments of natural history, but we do not, at present, know the details of his trips. He published an interesting account of his travels in Mexico, in *Zoe*, a biological journal printed in San Francisco from 1890-1893; an article in the *Overland Monthly* for 1884, entitled, "A Naturalist in the Desert," and an article on collecting in Alaska, which I cannot now locate. Other papers are found in *Entomologica Americana*, *Canadian Entomologist*,

Papilio, *Entomological News*, and Edwards' *Butterflies of North America*; I think the most important contribution which he made to science was the help he rendered to W. H. Edwards, in his great work just mentioned. In the *Ornithologist and Oologist*, for February, 1885, we find an article entitled, "An Experiment in Bird Taming, with *Phainopepla nitens*"; his name is frequent in the two large volumes of the Geological Survey, Botany of California, as he was an enthusiastic botanical collector. In fact he was a naturalist in the strict sense; they are becoming rarer every day. His book, *Butterflies of the West Coast*, published in San Francisco in October, 1905, was really an epoch-making publication, notwithstanding the numerous inevitable mistakes. The fire and earthquake of April 18, 1906, destroyed the publishing house, and the book is now quite rare.

Wright was a close friend of the two pioneer naturalists, Edward Palmer and C. C. Parry, and made many trips with them. He was acquainted with many more, if not most, of the early naturalists, but the data are not now obtainable.

The following butterflies and moths have been named in his honor by different entomologists: *Melitaea wrightii*, *Copaeodes wrightii*, *Scepsis wrightii*, *Gluphisia wrightii*, *Lep-tarctia wrightii* and *Selidosema wrightiarium*. Wright named many species, but most of them, especially those in his 1905 book, are synonyms.

W. G. Wright has played his part, doubtless as well as he knew; he has added something to science, and has helped others in their researches, which is as much as any one can do. The following quotation from his book expresses the spirit of all scientific work: "The most that we can do is to note down the things as we find them, and an aggregation of these notes after a series of years will afford a distinct step forward in the investigation."—FORDYCE GRINNELL, JR., Pasadena, Cal.

I visited him several years ago, an account of which I published in the pages of this magazine, Volume XXII, pages 11-13. He was a kindly man, and was known and loved by all the children of San Bernardino.—KARL R. COOLIDGE.

William Forsell Kirby.

(Portrait, Pl. IV*)

From *The Entomologist*, of London, for December, 1912, we learn that this diligent and laborious entomologist died on the 20th of November last. He was born in 1844, the son of Samuel Kirby, banker, of Leicester, and after twelve years in the Museum of the Royal Dublin Society, came to the Zoological department of the British Museum of Natural History in 1879, where he remained for thirty years, until his retirement, in 1909.

He published on many groups of insects, the Lepidoptera being perhaps his favorite order. One of his early works was a *Manual of European Butterflies* (1862), while he was a collaborator on Seitz's *Macrolepidoptera of the World*, now publishing and recently reviewed in these columns.

The students of the Lepidoptera owe a large debt of gratitude to Mr. Kirby for the production of two works of very great value. *A Synonymic Catalogue of Diurnal Lepidoptera*, published in 1871, with a Supplement in 1877, did much to advance the study of these insects. It was invaluable both to the collector and the systematist, and very frequently consulted by both. Even though other catalogues appear, Kirby's will probably always be of use. In the same category is his *Catalogue of Lepidoptera Heterocera: I. Sphinges and Bombyces*. This work of 951 pages was published in 1892 and was twenty years in preparation. Accurate and up-to-date catalogues are essential to study and some branches of entomology are greatly retarded by the lack of such works. He wrote *A Hand-book of the Order Lepidoptera* (1894-1897), and, in conjunction with H. G. Smith, *Rhopalocera Exotica* in three volumes (1887-1902). This latter is a beautifully illustrated work, in color, and contains descriptions of many species. He

*Our portrait is taken from a photograph sent by Mr. Kirby about 1896. In a letter of June 6, 1906, he mentions that "Thomas Wright has just given a portrait of me in his new life of Sir Richard Burton, with a notice, in which, however, there are several misprints." Another portrait has appeared in the *Entomologist* for January, 1913.

also wrote the text of an English Edition of Huebner's *Exotic Butterflies*, which was edited by P. Wytzman, in three volumes, and 491 colored plates (1894-1908). H. S.

Mr. Kirby's Orthopterological work was entirely a matter of the last twenty years. In addition to several papers bearing on the classification of the Forficulidae, Blattidae and Phasmodae, a number of faunistic papers, chiefly treating of African localities and one on the status of generic names in the order proposed previous to 1840, appeared from his pen. The monumental work which made his name a very familiar one to the Orthopterist was the compilation and publication of his *Synonymic Catalogue of Orthoptera* (1904-1910). This indispensable work comprises three volumes and is the only general catalogue of the Orthoptera ever published. While containing a great number of clerical errors, this piece of work stands as one of the most important contributions to the systematics of the order.

J. A. G. R.

His earliest paper on the Neuroptera (Odonata) was published in his fifteenth year (1859), but although he dealt with the collections made by the *Challenger* (1884) and others, his important work on this group was not until 1889, when his *Revision of the Subfamily Libellulinae* appeared in the Transactions of the Zoological Society of London. Of this the most recent and most thorough-going student of our time, Dr. F. Ris, has written :*

Previously, with other authors, I was disposed to extend sharp criticism to this work on account of some very evident errors. On deeper personal acquaintance with the subject, this criticism has given way to a sincere recognition of Kirby's keen sense of the generically important characters and happy formulation of many criteria previously completely overlooked. The defects of the work are those of a pioneer in a field which had lain too long fallow. To-day I have found it right and practical to characterize the genera in the

*Collections Zoologiques du Baron Edm. de Selys Longchamps, Catalogue Systematique et Descriptif. Fasc. IX. Libellulinen, p. 11. 1909.

Libellulinae essentially in the sense understood by Kirby. If a number of his genera have been suppressed, this is due in the majority of cases to the discovery of new material connecting apparently separate groups.

In 1890, Mr. Kirby published, at his own expense, his *Synonymic Catalogue of Neuroptera Odonata, or Dragonflies. With an Appendix of Fossil Species*. This is the least of his catalogues in point of size, but has been greeted with hearty recognition of its usefulness by de Selys, Ris and others, in spite of certain far-reaching nomenclatural changes which have not yet gained general acceptance. His other papers on the Odonata are briefer and faunistic in character.

Mr. Kirby was very willing to help visitors and correspondents who desired information on the insects in the British Museum, or on bibliographical and nomenclatural subjects, as not a few of the readers of the NEWS can testify. Lying before the writer are twelve letters from him, from February 14, 1890, to January 13, 1909, chiefly replies to inquiries on one or other of these topics. One of these letters (April 25, 1899) refers to criticism of his work in these words:

In many ways my Entomological work has been that of a pioneer, and I cannot complain of younger men taking it up and following it out in greater detail than I have had time or inclination to do. I never complain of *fair* criticism; but such attacks as ——— and ——— have made upon me I do not regard in that light. If I chose, I could often retaliate on ——— in the same way, but I usually confine myself to corrections when they fall into line with my own work, and I seldom go out of my way to reply to attacks unless they are too unfair. But you need never be afraid of offending me by fair comment.

Another letter (September 24, 1904) is of interest in giving his own estimate of his work:

My entomological work has always been rather bibliographical than practical; getting existing material into such order that others can take them up and work them out in detail. Hence it is easy for younger men to outstrip me in practical entomological work; and for minute details I never had any particular taste.

In January, 1909, he wrote:

I am just retiring from the Museum under the age limit but shall

continue to work on semi-officially or unofficially for some little time probably, and it is not impossible that I may later on undertake a new Catalogue of Odonata for the Museum.

He continued to visit and work at intervals at the Museum until August or later of the past year (1912).

In May, 1899, he paid a three weeks' visit to his brother in Boston, Massachusetts, but did not travel much in the country.

His literary labors resulted also in many popular books on entomology, in writings on folk-lore and ethnology, and in at least one volume on *Evolution and Natural Theology*.

Mr. Kirby's wife died some years ago; he is survived by a son.

[Since the above was written the January number of the *Entomologist's Monthly Magazine* has reached us with an obituary notice of Mr. Kirby, containing a number of additional interesting details]

P. P. C.

Peter Cameron.

Two obituary notices, of very different character, of this voluminous writer on Hymenoptera have appeared in the January issues of the *Entomologist's Monthly Magazine* and of the *Entomologist* respectively. From them we learn that he died at New Mills, Derbyshire, England, December 1, 1912, aged sixty-five. His earlier years were much handicapped by poverty and ill health. Throughout his life he was known to very few of his fellow entomologists. His principal works were a *Monograph of the British Phytophagous Hymenoptera* in four volumes published by the Ray Society, 1882-1892, and volumes I and II of the Hymenoptera of the *Biologia Centrali-Americana*, 1883-1900. His collection of British Phytophagous Hymenoptera and a large number of his exotic types are in the British Museum of Natural History, others forming part of the Rothney collection of Indian Hymenoptera are in the University Museum, Oxford.

CORRECTION.

News for January, 1913, page 3, line 8, the date of birth of Raphaele Peale should be 1774, instead of 1744.



WILLIAM FORSELL KIRBY



1. EVERES ARGIADES; 2. E. CORETAS; 3-5. E. COMYNTAS; 6-10. E. AMYNTULA.
BETHUNE-BAKER.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXIV.

MARCH, 1913.

No. 3.

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Everes comyntas and *amyntula* (Lepid.).

By G. T. BETHUNE-BAKER, Edgbaston, Birmingham, England.

(Plate V)

A few years ago, when the late J. W. Tutt was preparing his history of *Everes argiades* for his work *British Lepidoptera*, he asked me for my views on the species and its allies. This involved an intricate correspondence with my friend and also with Dr. Chapman, who was likewise working at the species with the same object. It led, later on, to considerable research as to the Eastern forms of the genus and in like manner to those from the far West. In this paper I propose to consider these latter only, inasmuch as the questions arising among the Indian and Chinese species do not enter into the relationship of *comyntas* and its allies. Primarily my best thanks are due to Mr. W. P. Comstock, of New York, who has taken great trouble and care in elucidating the number of broods in that area and in giving me a bibliographical list of the species

here enumerated. I have also to thank Mr. W. W. Newcomer and many others who have liberally given me specimens from all parts of North America, so that I now have in my collection over 600 specimens from different parts of that continent and have examined at least a couple of hundred in other collections.

Careful examination and comparison reveal variations occurring in American forms on much the same lines as obtain in European forms, but we have, however, none of the beautiful blue females that are fairly frequent in America. The dull blue of our *polysperchon* is so dull and of such restricted area that it does not at all approach to the bright and large suffusions of *comyntas* or the almost entirely blue females that are apparently the prevalent form in Southern California. Mr. N. Criddle sent me some specimens of *amyntula* from Aweme, Manitoba, which approximate somewhat closely to the Austro-Hungarian and Balkan *decolorata* Stgr. on the upper side, but the under side is quite different. In both the American insects the size varies very considerably, quiet as much—nay more—in the apparently single-brooded *amyntula* than in the many-brooded *comyntas*.

It may be well now to treat with the species individually, but in so doing I would say I do not propose to deal with all the literature, but rather to consider the species in relation to each other.

Everes comyntas Godart.

Everes comyntas Scudd., Syst. Rev., p. 35 (1872); Buff. Bull. iii, p. 114 (1876); Butts, pp. 130, 152, 308, fig. 125 (1881); Butts, New Eng., ii, p. 911, pl. VI, ff. 9 and 10 (1889); Brief Guide, p. 123 (1893). Staudinger and Rebel, p. 77 (1901). Dyar List, Bull. U. S. N. M., p. 45 (1902). Tutt. Brit. Butt., III, p. 72 (1909).

Lycaena comyntas Doubleday, List Lep. B. M., ii, p. 43 (1847). Edwards, Can. Ent., viii, p. 202 (1876). Middl., Lep. Ins. Ill., x, p. 95 (1881). Fernald, Butts. Maine, p. 01, f. 32 (1884). Edwards, Cat. N. Am. Butt., p. 65 (1884). French, Butts. E. Un. States, p. 292 (1886). Maynard, Butts. New Eng., p. 40, pl. V, ff. 50, 50a (1886). Godm. and Salv., Biol. C. Am. Rhop., ii, p. 108 (1887). Ckll., Trans. Am. Ent. Soc., xx, p. 355 (1893). Grant, Can. Ent., xxix, p. 208 (1897). Williams, Can. Ent., xxxv, p. 187 (1903).

Polyommatus comyntas Godart, Enc. Meth., ix, pp. 607 and 660. Latreille, l. c., 608 (1819). Durban, Can. Nat., v, p. 246 (1860). Morris, Syn. Lep. N. Am., p. 83 (1862). Harris, Ins. Inj. Veg., 3d ed., p. 275 (1862); Entom. Corresp., p. 275 (1869). Aar., Can. Ent., ix, p. 200 (1877).

Argus. Bdv. and LeConte, Lep. Am. Sept., p. 120, pl. 36, ff. 6-9 (1833).

Comyntas. Strecker, Lep. Rhop. Het., p. 82 (1874). Mead, Wheeler's Rep., v, p. 783 (1875). Strecker, Cat. N. Am. Macrolep., p. 92 (1878). Packard, Guide, p. 265 (1874). Pilate, Papilio, ii, p. 66 (1882). Beutenmüller, Des. Cat. Butt., p. 284 (1893). Skinner, N. Am. Rhop., p. 59 (1898). Holland, Butt. Book, p. 268 (1898). Smith, Ins. N. J., 2d ed., p. 376 (1899). Beutenmüller, Butt. Vic. N. Y., p. 36 (1902). Smith, Ins. N. J., 3d ed., p. 416 (1909).

Plebeius. Kirby, Syn. Cat., p. 653 (1871).

The variations of the upper side consist chiefly in the width of the blackish termen and in the amount of orange color at the anal angle of the secondaries. I have before me specimens in which the margin is almost linear, whilst in one from St. Louis, Mo., it is nearly 3 mm. wide and there are gradations through from the one to the other; in that same specimen also (from St. Louis) the orange spot, or rather two spots, at the anal angle are larger than in any other male specimen. The spotting of the under side is very constant, especially in the primaries. I have only one or two that show any obsolescence; in those cases the costal and the third spot in the macular transverse band are almost absent. In one the costal spot has quite disappeared; in the secondaries this characteristic is less rare, the spot below the second costal spot is not infrequently absent or obsolescent, whilst the third spot in the curved macular row, below the one just mentioned, is also affected in a like manner. In only one specimen do I find a nearly complete obsolescence, viz., one sent by Mr. Newcomb from Oakland, Michigan. In this the two bottom spots in the transverse macular row are present in the primaries, and in addition to this a very minute spot is visible between veins 5 and 6 on the right wing only; in the secondaries the basal and outer spot are present but very small, whilst there is a minute spot visible on the inner margin of the left wing, and the dashes closing the cells are visible but fine.

The usual form of the female, so far as my specimens go, is brown from the Eastern States, with very occasional touches of blue from St. Louis. I have three decidedly blue specimens out of about two dozen, which (blue) form increases as we go westwards until in New Mexico it appears to be the typical form. I have a very long series from Fort Wingate (Coll. Woodgate), but have not got one entirely brown female, all with one exception showing a large suffusion of blue. These were sent over to England as *amyntula*, but there is no doubt that they are *comyntas*, though they are larger than the Eastern specimens of that insect. I regret to say I have seen no females from Mount Shasta, where *comyntas* and *amyntula* are reported as flying together. I have examined a few males of the former species from that district which are without doubt *comyntas*. From Canada I regret that I have not sufficient material to form any conclusions on; from Halifax, N. S., the females are brown.

There appears to be little doubt that in the New York district the species has four broods. Mr. W. P. Comstock has taken a great amount of trouble to work out this subject for me. Here I give the records that he has kindly furnished me with, which refer to his observations for the year 1909, it being in the early part of that year that our correspondence commenced.

"First brood occurring at Jamesburg, N. J.

"May 8th I took four males and one female, all quite fresh.

"May 17th, nine males and three females, which latter were used for breeding, all being still fresh.

"May 24th, twelve males, but no female, seen; most were a little worn.

"May 30th, only two males were seen.

"June marks a distinct period between the first and second broods, no specimens being seen at Jamesburg.

"Second brood.—July 4th a quite fresh male and female were taken, also a larva in its first stage.

"Second brood taken at Newark, N. J.

"July 5th, the species was fairly thick, all fresh specimens.

"July 25th I took five males and three females, some much worn, only one fresh, which was probably a forward of the third brood.

"Third brood.—On July 24th I bred specimens from larvae taken at Jamesburg during the first week in July.

"August. The species is on the wing during the whole of this moult.

"September. Not infrequent through the greater part of this month also. On the 25th of September I found larvae nearly fed up, whilst on the 7th and 31st of October I found a pupa of it."

I have before me Mr. Comstock's records of the species from 1899 to 1908, from which it is evident that, with the exception of the month of June, it is on the wing in the New York district and within a radius of fifty miles from the centre of that city from early May till the middle of September. In June he took a single specimen twice, only once in 1899 on June 25th at Van Courtlandt Park, New York City, and one on June 21st at Jamesburg in 1908. It appears, therefore, that there are four broods, the first and second with a distinct interval, viz., the month of June, whilst with the second, third and fourth there may be overlapping. It is not unlikely that the fourth brood may be only a partial one.

I have a long series all dated from St. Louis, Mo., where they appear on the wing earlier in the year, viz., April 17th. On this date I have four males and one female. In this locality the interval between the first and second brood appears to be in the latter part of May and the early part of June, for on and after June 14, 1909, it was regularly on the wing to the end of July. I have no specimens taken in August, but several in September, the latest date being September 16, 1909.

Mr. Frost sent me a nice series from Framingham, Mass., all dated, where it occurs plentifully in July and August. No doubt it also occurs earlier, but I wrote to that gentleman late in the year.

From Michigan (Oakland County) the dates are similar to the New York district, but the females are peculiar, being sooty black with a limited suffusion of deep but brightish blue scales.

From New Mexico (Fort Wingate, Woodgate Coll.) my specimens, a long series, start on the seventh of May, are on the wing regularly throughout June and, I understand, also in July and August. It is interesting that this is the only locality that I can trace where there is no interval between the first and second broods.

Other localities that I am aware of from my own and other collections, including the British Museum, are: North Carolina, Nevada, Maine, Pennsylvania, Florida, Colorado, Arizona, Oregon, Oklahoma, Sonoma Co., San Bernardino and Shasta (Cal.), Texas, Vera Cruz, Orizaba, Polochic Valley, Guatemala, British Honduras, Nicaragua. All the females from the last half-dozen localities are suffused with blue, whilst a characteristic of the Californian males is that they have quite narrow black borders.

The larva (*teste* Comstock) is highly variable in color—red brown, violet brown or yellow brown—as a rule, but he has had them green, also red brown striped with green. Generally they are speckled with lighter, from which the hairs spring. On July 4, 1908, he found fifty eggs on *Desmodium* (? sp.) at Monmouth Junction, N. J., which duly hatched and fed up well on red clover flower heads. The first imago appeared on July 27th. August 2d more eggs were easily found on the same species of plant at Snake Hill, N. J. On September 7th both ova and larvae were found at Dennisville, N. J., on *Lespedeza hirta*, and on the 16th of the same month forty larvae and a few unhatched ova were found on the same species of plant at Andover, N. J. All these larvae hibernated, but all died; my friend tells me he had thought that on account of their small size they were not full fed and he expected them to feed up in the spring. The probability seems to me that in a very favorable October there may be a partial fifth brood (this I say from the fact that Mr. Comstock found two pupae in that month), but that in ordinary seasons the larvae feed up fully in the autumn, hibernate in this stage and complete their metamorphosis in the spring.

Habits of the perfect insect.—Mr. Frost considers it is a species easily frightened, in which case it will suddenly drop to the earth and will crawl down almost into the roots of the grass: they often indulge, however, in play or quarrels, when they will frequently mount into the air to a considerable height.

Genitalia.—These prove conclusively in my judgment that the species is a form of *coretas*, not of *argiades*. I regard these as distinct species

on account of the differences in the genitalia—differences which appear to be constant. In *argiades* the aedoeagus is slender and of almost uniform width till quite close to the extremity; in *coretas* it is quite broad at the base, gradually tapering for two-thirds of its length, when it suddenly narrows and is fairly even to the apex; the clasps are heavier made, the upper curved hook-like extremity being stouter, shorter, and the curve much sharper in *argiades* than in *coretas*; the tegumen also differs, in *argiades* the central point, though sharp, is not elongate as in *coretas*, but more triangular, as it were, and from the central point the sides of the tegumen gradually slope off evenly, but in *coretas* they are quite distinctly shouldered, the latter species being less copiously and more finely haired in this region than in *argiades*; the falces or hooks of this region are more slender than is the case in the latter species (*argiades*).

In *comyntas* all these points are strongly emphasized. The aedoeagus is very decidedly stouter at the base, tapers more rapidly, but for a shorter distance, being only for a little more than half the whole length. The hooks of the clasp are longer and finer than even in *coretas*, whilst the softer lower somewhat spatulate and folded extremity of the clasp is proportionately longer than in *coretas*, but slenderer, thus in this one particular being rather nearer *argiades*. The tegumen is even squarer and more shouldered than in *coretas* and the falces are longer also; the fulcrum, or support for the aedoeagus, has a long stem and is placed near the middle of the clasp in this genus, but in *comyntas* its bifid arms are decidedly shorter than in either of the European species.

I started this investigation under the impression that the American species was *argiades* pure and simple. My final conclusion is that it is now a distinct species from either *coretas* or *argiades*, the markings and pattern are nearer the latter, but the genitalia have developed in the direction of *coretas* and have gone well beyond that species.

(To be continued)

Method of Breeding Lycaenidae (Lepid.)

I have had great success this past season in breeding Lycaenidae. By placing gravid females in glass-covered boxes, which were then placed in the sunlight, I induced practically every female so exposed to oviposit. Care should be taken that the sun's rays are not too intense. In this way I obtained ova of *Lycaena sonorensis*, *battoides*, *acmon*, *polyphemus*, *exilis*, *Chrys. arota* and *Thecla dumetorum*.—KARL R. COOLIDGE.

The Origin of the Oligotropic Habit among Bees (Hymen.).

By JOHN H. LOVELL, Waldoboro, Maine.

In the December, 1912, number of ENTOMOLOGICAL NEWS, Mr. Charles Robertson offers a number of criticisms on my treatment of oligotropic bees in the *Popular Science Monthly* for August, 1912. It should be premised that the paper was a popular presentation of the subject, from which unnecessary technicalities were omitted. In one or two instances Mr. Robertson gives the obvious meaning of the writer and then suggests an alternative view, from which he proceeds to differ; there would appear to be an evident desire to provide material for criticism. There was no intention on the writer's part of attributing the definitions of oligotropic and polytropic bees, which were given in the modified forms suggested by Mr. Robertson in 1899, to Dr. Loew. For the benefit of those not familiar with the literal meaning of these words it was stated that they signified adapted to few or to many flowers and originated with or were proposed by Loew.

Mr. Robertson says that *Epeolus* is a genus of inquilines. Formerly he asserted the contrary. In the *Bot. Gaz.*, 28:35, he said: "I have never believed that our species of *Epeolus* were cuckoos of *Colletes*, because there are more common species of the former than of the latter genus, and their phenological positions do not show the correlations which exist between *Andrena* and *Nomada*, *Megachile* and *Coelioxys*. Besides the maximum of *Epeolus* does not approximate that of any other genus of bees on which it might be supposed to be inquiline. Then they are more abundant than would be expected of inquiline bees. Mr. Ashmead's observations confirmed my views, and I have never doubted their correctness since I first read an account of them. In *Psyche* for March, 1894, p. 41, he states that he found *E. donatus* making nests in the ground and provisioning them with honey paste. *Epeolus* thus comes under the same category as *Prosopis* and is treated the same way in the table." Mr. Robertson is here positive

~~that~~ *Epeolus* is not a parasitic genus, and expresses an entire absence of doubt as to the correctness of this conclusion. Dr. Graenicher has shown (*Bull. Wis. Nat. Hist. Soc.*, 3:164) ~~that~~ *Triepeolus helianthi* is an inquiline of *Melissodes trinodis*. In 1910 Prof. Cockerell in "An Introduction to the Study of Rocky Mountain Bees" (*Univ. Col. Studies*, 7:183) described *Triepeolus* Rob. as a parasitic genus, but *Epeolus sens str.* is not thus characterized. In this locality I have never taken either sex of *Triepeolus donatus* except on the flowers of the Compositae. It can not be competition for pollen which leads this species and one or two others of the same genus to visit exclusively the inflorescence of this family. Evidently it is the attractiveness of the flowers.

In Southern Maine both sexes of *Halictoides novae-angliae* year after year visit exclusively the flowers of the pickerel weed; and I, therefore, call the species monotropic in this locality. Because in another region, where the pickerel weed is absent, it visits other flowers, Robertson would not regard it as monotropic anywhere. This is a matter of definition in which we differ. If a bee in a certain region visits only one species of flower for pollen I would consider it monotropic in that area, and I believe that this usage should prevail. It seems probable that any oligotropic bee, which extends into a region where the flowers it habitually visits elsewhere do not occur, will resort to other flowers. Robertson would seem formerly to have held a similar opinion for he says (*Bot. Gaz.*, 28:34), "When the flowers upon which a bee depends become extinct or rare, the bee may disappear or be forced to resort to flowers which originally it did not visit."

I am aware of the so-called analogy presented by other groups of organisms to oligotropism; and in my article mentioned certain Lepidoptera and Coleoptera, which live on a single plant species both in the larval and adult stages; yet the oligotropic habit does not appear so obvious to me as to Robertson. The honey bee, bumble bees and many other bees visit a great variety of flowers and the natural expectation would be that all bees are polytropic. Certainly this is what most

persons do suppose. Oligotropism could not have been self-evident to Hermann Müller or he would not have written (*Fertilisation of Plants*, p. 570): "In general anthophilous insects are not limited by hereditary instinct to certain flowers, but they wander about getting their food on whatever flowers they find it," etc.

In the paragraph beginning with the sentence, "The oligotropic habit is not beneficial to flowers, it concerns the bees alone," oligotropism is stated to have arisen independently of any benefit received by the flowers and solely because it is an advantage to the bees. It would seem that no one could be misled by the paragraph as a whole, except perhaps an over-willing critic. I can hardly believe that Robertson supposed that I intended to deny the value of "flower fidelity" to flowers. Personally, I believe that flower fidelity on the part of bees is an advantage to flowers, as I stated later in my article and as Robertson noticed; though the advantages of cross-pollination are questioned by some ecologists. The writer distinguishes between oligotropism and flower fidelity. The oligotropic habit is flower fidelity carried to the extreme. Polytrropic bees also possess flower fidelity. It would not be an advantage to a flora for all the bees to be oligotropic, since then many entomophilous flowers would not be visited by these most important agents in pollination. The time of flight of many polytrropic bees would necessarily be greatly reduced, which would clearly be a great disadvantage. I know of no native flower which is wholly dependent for pollination on an oligotropic bee; usually the flowers are visited by many other bees and the oligotropic bee may be comparatively rare and unimportant. *Andrena solidaginis* is so rare in this locality as to be of no significance in the pollination of *Solidago*. It is sufficient if a flower is effectively pollinated, and repeated visits may be and often are useless. Therefore the entomophilous flora of a region, as a whole, is not better pollinated because a part of the bees are oligotropic than it would be if they were all polytrropic.

How has the oligotronic habit originated? Mr. Robertson

~~believe~~ that it is the result of an effort on the part of the ~~different~~ species of bees to avoid competition. I hold that it ~~has arisen~~ because of the direct advantage gained coupled with a short term of flight.

While the white clover is in bloom in the Eastern States the honey bee visits the flowers almost exclusively for nectar and pollen. There is here no question of competition; primarily the bees come to procure the great abundance of nectar found in the clover heads, and pollen is gathered from the same flowers as a matter of convenience. If the honey bee flew only while the white clover was in bloom it would be regarded as a monotropic visitor of this plant; but as it flies throughout a large part of the year and requires ample stores it can never become oligotropic. In California for a time honey bees gather nectar wholly from the sages; in Michigan from the raspberry or willow herb; in the Central States from the basswood; in New York from buckwheat, and in Maine in the fall they obtain both pollen and nectar largely from the golden rods. The correlation existing between the domestic bee and various flowers affords an ever-present illustration of the way in which the oligotropic habit might arise in the case of a bee with a short term of flight.

There can be no competition where there is an over-abundance of supplies. No other early blooming entomophilous flowers yield so much pollen and nectar as the willows. No other genus of honey plants in early spring is so valuable to the apiarist as *Salix*. The honey bees gather great quantities of pollen, and in some localities they are reported as storing from 8 to 15 pounds of honey per hive from this source alone. The remarkable fitness of the willows to the needs of Andrenid bees has been observed by Mr. C. M. Weed (*Ten New England Blossoms*, p. 9), who remarks upon the great abundance of pollen and nectar and the absence of any equally attractive flowers. In a paper on "The Relations of the Andrenine Bees to the Entomophilous Flora of Milwaukee County" (*Trans. Wis. Ac. Nat. Sciences*, Vol. 15), Dr. Graenicher has given a list of the 47 species of *Andrena* occurring in that locality

with their time of flight and the flowers they visit for pollen. No species of *Andrena* has ever been seen in spring before the willows blossom, "although two species of entomophilous plants *Erigenia bulbosa* and *Hepatica acuta* open up their flowers earlier than this willow" (*Salix discolor*). The two species which first appear fly for about a month, and are both oligotropic visitors of *Salix*. At the beginning of their flight they are, of course, exposed to no competition whatever from other species of *Andrena*. From March 31st to April 28th ten species of *Andrena* appear successively, of which four are oligotropic visitors of *Salix* with an average time of flight of about 44 days. Six species are polytropic, but they all obtain a part of their pollen from the willows; in Maine they are often present in large numbers so that the oligotropic species would not escape competition with them if there was a scarcity of pollen. Their average time of flight is about 63 days, or 43 per cent. longer than that of the oligotropic species, which greatly increases the probability, or may render it necessary, that they obtain a part of their pollen from other flowers than those of *Salix*. Common and widely distributed species, like *A. vicina*, which flies for about two months, doubtless often find it more convenient to gather pollen from flowers which are nearer their nests.

Certain species of *Andrena* visit the willows exclusively because during their comparatively short time of flight they can readily obtain all the pollen and nectar they require, and there is no occasion for them to go elsewhere. But they do not thus, as has been shown, escape the presence of the polytropic species, which are frequently very common. Of the four species of *Andrena* oligotropic to *Salix* in Maine only one is common, *A. illinoensis*, a small bee, not likely to fly far. The oligotropic *A. mariae* is comparatively rare, while the polytropic *A. weedi* Vier. and *A. hippotes* Rob. are very common on the willow aments; it sounds, therefore, somewhat paradoxical to say that the former escapes competition with the polytropic forms because of their absence. It is because of the great abundance of pollen and nectar that there is no

competition with the polytropic bees severe enough to force the oligotropic species to go elsewhere.

The maximum of species of *Andrena* on the wing at one time in Milwaukee County, Wis., says Dr. Graenicher, is reached in the latter part of May and lasts throughout the first week of June. Various common shrubs, which produce their flowers in great profusion are then in bloom, as *Viburnum*, *Crataegus*, *Cornus*, *Ribes* and *Rubus*, besides a great abundance of umbelliferous flowers. This maximum, therefore, "corresponds with the blooming period of a great variety of flowers, representing different families." The majority of the species of *Andrena*, or 17, are polytropic, as the character of the flora would make probable. Seven species are oligotropic, two getting their pollen from the late blooming willows, one from the strawberry, a very common and widely distributed plant; one from *Geranium maculatum*, and two from the very abundant flowers of *Thaspium trifoliatum aureum* and *Taenidia integerrima*, two species of Umbelliferae. As in the case of the willows the flowers of the two last named plants are visited by many polytropic bees. The oligotropic species, then, visit very common flowers, which are in bloom during the entire time of their flight, and which produce pollen and nectar in quantities sufficiently large to prevent injurious competition between them and the many polytropic bees which visit the same flowers.

The seventh species (*A. geranii*) in Milwaukee County gets its pollen from *Hydrophyllum*, but at Carlinville, Ill., according to Robertson, it also gathers pollen from *Blephilia ciliata*. Observations on the visits of the various species of *Andrena* are far too few in number. Robertson says that he has observed 595 visits of 51 species. This is only 11.6 visits for each species. A large number of observations from many localities is very desirable, and might modify our ideas on the constancy of oligotropic bees.

The evidence against oligotropism being an effort on the part of bees to avoid competition for pollen becomes much stronger when we consider the summer and autumnal species

of *Andrena*. In Milwaukee County, Wis., according to Graenicher, there are then 11 species of *Andrena* on the wing; and all of them, with one exception, are oligotropic visitors of the Compositae. The single exception (*A. parnassiae*) is found only near Whitefish Bay, Lake Michigan, where *Parnassia caroliniana* produces a great abundance of flowers. Evidently this bee gets its pollen from these flowers because they are very abundant in the one locality where it is known. As stated above all the other species, ten in number, are oligotropic to the Compositae. Many genera of this family are excessively common, as the golden rods, asters, sunflowers and thoroughworts, and yield immense quantities of nectar and pollen. There are very strong inducements for these bees to visit these flowers, and comparatively little for them to go elsewhere. These oligotropic species of *Andrena* cannot visit the Compositae to avoid competition with other species of the same genus because there are no other species flying. Nor can they receive any benefit from other species visiting the flowers of other families for the same reason—the entire absence of such Andrenid bees. There is but one explanation possible, and that is that they visit the Compositae exclusively for the direct advantages thus obtained.

This point is still further illustrated by four autumnal species of *Andrena*, which in New England restrict their visits chiefly to the golden rods. The various species of *Solidago* are extremely common and occur in the most diverse situations from marine beaches to high, open woodlands. For a time honey bees visit almost exclusively the inflorescence of this genus, from which annually they gather tons of honey and a great amount of pollen. The visits of the domestic bee are not the result of competition, but solely because of the advantages gained. For the same reason *Andrena canadensis*, *A. nubecula*, *A. hirticincta* and *A. solidaginis* get their pollen and nectar mostly from this genus.

Halictoides novae-angliae, as already stated, visits exclusively in this locality the spikes of the pickerel weed (*Pante-*

~~de~~ *cordata*). There is no other species of this genus of bees found here. They are rather small bees with a weak flight. As pollinators of the flowers they are much less important than bumble bees, which are present in large numbers and make their visits very rapidly. The flowers are very abundant and offer pollen, nectar and shelter. The nests of these bees are probably close at hand. These are excellent reasons why they should restrict their visits to the inflorescence of the pickerel weed. They cannot be influenced by competition with any other species of *Halictoides*.

The majority of oligotrophic bees flying in summer and autumn, whether they be species of *Colletes*, *Andrena*, *Perdita*, *Panurginus* or *Melissodes*, visit exclusively the Compositae. This course tends to produce competition, not to lessen it. The large and crowded inflorescence consisting of many small flowers which can be quickly and easily visited, the great abundance of pollen and nectar, and the commonness and wide distribution of many species are the factors which attract these bees. No other family of plants blooming at this season offers equal advantages. In a paper on the bees of northwestern Wisconsin, Dr. Graenicher gives a list of 30 oligotrophic species, of which 19 get their pollen from the Compositae. Many species of *Perdita*, according to Professor Cockerell, are found only on the Compositae, 12 being taken on the flowers of *Bigelovia wrightii*. He further states that there is a "relationship between the size of the bees, the length of their tongues, and the kinds of flowers." In Maine 3 species of *Colletes*, 5 of *Andrena*, 1 of *Perdita*, 1 of *Panurginus*, and 4 of *Melissodes* are oligotrophic to the Compositae; and at Carlinville, Ill., a larger number of species in all these genera (except *Perdita*) are reported by Mr. Robertson to get their pollen from the inflorescence of this family. The fact that so many species of bees are oligotrophic to the Compositae would seem alone to refute the theory that this habit is an effort on their part to avoid competition by visiting different plant families.

In conclusion it does not seem difficult to understand how

certain bees, with a short term of flight and already exhibiting flower fidelity, have acquired the habit of restricting their visits to common flowers, which offer a great abundance of food materials. Accessory factors are small size, time of flight, length of flight, weak flight, vicinity of nests, and the number of bees. On the other hand, no satisfactory evidence has ever been presented to show that oligotropism is an effort on the part of bees to avoid competition. If there was a scarcity of pollen sufficient to promise severe competition it would appear that it would be a disadvantage to any species of bee to restrict its visits to one kind of food plant.

A new Erycinid from South America (Lepid.).

By LEVI W. MENGEL, Reading, Pa.

Hermathena quinquemaculata, n. sp.

Expanse of spread insect, 1.03 in. Distance from apex of anterior wing to base, .56 in. Length of body, .41 in.

Color, white, with the following exceptions: Apex of the anterior wing, black. There is a black spot on the middle of the exterior margin.



Hermathena quinquemaculata n. sp. Natural size.

The posterior wing is white, with a small black spot on the apex, another in the middle of the exterior margin and a third towards the anal angle.

The base of the fore wing is black. The head, collar and scapulae are black. The abdominal segments are white, except the anal extremity, which is black. Legs, white. The antennae have black knobs, otherwise white.

Type.—Collection Mengel. *Habitat*.—Neiva, U. S. Columbia.

The Suffert Collection of Butterflies (Lep.)

The large collection of African butterflies, with its numerous types, formed by the late Herr E. Suffert, of Berlin, has passed into the Joicey Collection. Entomologists are invited to compare their specimens with the types.—J. J. Joicey, The Hill, Witley, Surrey. (*The Entomologist*, London, Dec., 1912.)

The Danaine Species of North America and their Mimics (Lepid.).

Bates' Theory as Applied to These Species.

By J. R. HASKIN, Los Angeles, California.

Introductory.

Each of the North American *Danaidas*, occupying separate and fairly well-defined territories, has a corresponding species of *Limenitis* so clearly resembling it in general appearance as to force the conclusion that their resemblances are the result of mimicry.

Professor E. B. Poulton (1) (5) has pointed out that these American species offer one of the most clear-cut cases of mimicry in the world. *Plexippus* and *archippus*, *berenice* and *floridensis* are well known and a great deal of literature is at hand concerning them. During the past few years my attention has been called more particularly to *D. strigosa* and *L. obsoleta*. The curious mimetic relationship between the other members of the two genera is so strikingly followed out in these two comparatively unknown species that I venture to describe them at some length.

D. strigosa and *D. berenice*.

It is well known that the North American *Danaidas* consist of *plexippus* and *berenice*, together with Bates' form *strigosa*. *Strigosa* is generally understood to be like *berenice*, except that the veins on the upper side of the secondaries are finely bordered with ashen gray. There is, however, a much more noticeable difference between the western dry-climate form, which we believe Bates had in mind when he described and named *strigosa*, and the form *berenice* found in the humid semi-tropical climate of Florida. In Arizona *strigosa* is very common and in certain sections thousands of them may be seen during a favorable season. Long series of them show that the rich, uniform, chocolate-brown of the upper side of *berenice* occurs only in the basal area of both wings and along the costal edge of the primary halfway to the apex. The discal areas shade outwardly to a lighter brown and the limbal areas are markedly

light brown. On the under side, especially of the secondaries, the brown is a shade lighter than on *berenice* and may be described as being between the light brown of *plexippus* and the chocolate brown of *berenice*. The black borders of the wings are not so heavy as on *berenice*, nor are the veins on the under side of the secondaries so heavily outlined with black. In my series of *berenice* these black lines on the under side are generally well bordered with ashen gray. This is not often the case with *strigosa*. *Strigosa* generally, though not always, has the veins on the upper side of the secondaries bordered with ashen gray. It very seldom, however, is marked heavily enough to give the butterfly a "streaked" appearance.

Strigosa runs very true to the form described above. It extends over a fairly wide strip of territory from Southern California in the neighborhood of Los Angeles eastward at least to longitude 97 degrees west, and it probably occurs still further east. It would be of great interest to learn from collectors between Texas and Florida whether the change between the two forms occurs gradually or whether *strigosa*'s territory is confined to the semi-arid region of the Southwest. From the limited amount and variety of Florida material available for my study I rather suspect that the late fall brood of *berenice* inclines toward the *strigosa* type of coloration.

Limenitis obsoleta.

Obsoleta is immediately noticeable for the remarkable accuracy with which it has mimicked the coloration of *D. strigosa*. When I first observed it drifting lazily about on the plains near Phoenix, Arizona, I did not give chase, as I had long series of *strigosa*. It was not until I saw one sitting on a flower with wings outstretched and the tell-tale bar across the secondaries plainly in evidence that I realized that it was *obsoleta*. It has exactly the same shade of dark brown in the basal area and along the costal edge. This shades lighter outwardly to a line of black-bordered white spots separating the discal and limbal areas. Outside of this line the brown is noticeably lighter, imitating the corresponding areas in *strigosa*.

On the under side the same close imitation of *strigosa* col-

oring occurs and there is apparently an ingenious attempt to mimic the white spots and dark veins with the means at hand. The shading of the brown is wonderfully good. The veining on the under side of *strigosa*'s secondaries is black with traces of ashen gray bordering. This is followed in *obsoleta* even to traces of the gray border. On the primaries of *obsoleta*, while the veining is black as against brown in *strigosa*, the black is confined to the veins and is not conspicuous.

On the under side of *strigosa* there is what appears at a slight distance to be an irregular black and white line across the secondaries. The combination forming this consists of a black-bordered white spot midway on the costa, the heavy black discocellulars irregularly bordered with grayish-white blotches, and, on the males, the scent pouch which is black centered with white. In approximately the same position on *obsoleta* is a heavy black line with the inner edge bordered with white which is broken up by the black veins into a row of white spots. From its location it reminds one of the white bar of *L. arthemis*, which has been almost obliterated.

This black line and the white spots "show through" on the upper side of the wing and is not in harmony with the close mimicry otherwise displayed.

My theory concerning this feature is that in the attempt to mimic the under side of *strigosa* this bar and the spots were retained and that they persisted on the upper side also. A similar attempt is made on the primaries to imitate the white spots of *strigosa*. Here the black bar is nearly eliminated except near the costal edge. The black and white show through on the upper side also, but assist at this point in the mimicry. In addition to these points all possible traces of white in *arthemis*, and the pale blue lunules in the borders also, are emphasized in white on *obsoleta* in order to give as much as possible the appearance of a considerable number of white spots on the wings.

In support of my theory I would suggest that the *Danaiidas* nearly always keep their wings folded, with the under sides showing, when they are at rest or feeding on flowers in the open. Why should not *obsoleta* attempt the mimicry of this side at the expense of the other?

L. floridensis.

The dark chestnut-brown *floridensis* follows the typical dark form of *D. berenice* just as *obsoleta* follows *strigosa*. A similar uniform shade of dark brown prevails. In this case the white spots have disappeared entirely on the upper side of the male's secondaries and show but faintly on the female's. We may surmise that as the white spots showed too vividly on the very dark coloration of this species they were eliminated as much as possible. They remain on the primaries, where they are needed to mimic the spots on *berenice*.

D. plexippus and L. archippus.

These well-known butterflies have been described so many times that very little need be said about them. Concerning the bar across the secondaries of *archippus*, is it possible that *archippus*, like *obsoleta*, has attempted to imitate the discocellulars of its model?

Archippus has been able to make a more perfect imitation of its model than have the others for the reason that *plexippus* is black-veined throughout. If *strigosa* and *berenice* were similarly veined, the resemblance of their mimics would doubtless be as striking when a detailed comparison was undertaken.

Bionomic Features of the Limenitis Group.

The dark, white-barred Admirals are essentially frequenters of the wooded districts. They may be found flitting about the open spaces of the deep woods and along the edges, but as a rule do not venture far out in the open. Their flight is quick and their attitude alert and vigilant.

The brown Admirals seem to have taken on the habits of their models as well as their coloration. *Archippus* may be found balancing its slow flight far out in the open meadows and perched on the flowers with wings folded in much the same manner as *plexippus*.

The early stages of *obsoleta* are passed among the willows along the Verde and Salt Rivers in Arizona and probably along the other water courses of this country also. I had the good fortune to run into a swarm of beautifully fresh speci-

~~mens~~ in a thicket of willow near Phoenix, Arizona, and had no difficulty in capturing a fine series. Their flight was slow and unconcerned—not at all like the nervous action of its white-barred cousins. Other specimens taken on the open mesa several miles from the river were not so fresh and evidently had strayed from their breeding grounds. The flight of these was so like *strigosa* that I at first mistook them for their models and allowed a number of them to escape.

The Batesian Theory as applied to these species.

If we could look back into the dim past ages, we might first obtain a glimpse of North America with the white-barred *Limenitis* in evidence. The next glimpse might show a change in the climate about the Behring Sea which enables the progenitor of *plexippus* to find its way across from Asia, where the Danaidas are very much in evidence. This insect, finding the climate and food of the fairly cool temperate region to its taste, increases and multiplies to its present magnificent form. (1)

Strigosa may have drifted across at the same period as *plexippus*, or maybe at a later period. It is remarkably like certain of the Asiatic Danaidas, and probably has changed but little. It found its way down the Pacific Coast and drifted eastward over the hot, dry Southwest. When it reached the humid region of the Southeast it became darker and richer in color.

What happened to our native *Limenitis* from this time on? We have *astyanax* and various forms of white-barred *Limenitis*, the prevailing colors of which are blue and black. We have, also, three well-defined species entirely different in general appearance from the others in that the prevailing color is rich brown. Each of these three species is a remarkably close mimic of the particular species of *Danaida* prevailing in its territory.

Who can doubt that we have here a clear-cut case of imitation by selection? We cannot reasonably conceive that these are all accidental cases of similarity. One such instance might be imagined, but not three.

Why this has happened may eventually be explained to the satisfaction of everyone. Already the ground work on which to frame an answer may be found in the several hundred pages of recorded observations made in Africa and the East Indies. (2) (3). These seem to show that there are certain qualities about the Acraeinae, Danainae and others which make them distasteful to Mantidae, spiders, lizards, birds, mongooses and monkeys. On the other hand, there are many other butterflies which are eagerly eaten.

It is not easy even to imagine how this mimicry has been produced, nor through what ages of time it has taken place. We have, however, recorded observations (2) made in the field covering the actual hunting and capture of butterflies by birds, the finding of quantities of butterfly wings in birds' nests and on the ground under them; pages of illustrations (2) (3), showing butterflies with wings damaged in such a manner that they could have been torn only by the butterfly wrenching itself from the grasp of an enemy. Probably every field collector can recall numerous instances of this same occurrence. I found no less than four just such specimens in a lot of seventy taken during my last day's collecting this year in Arizona. Incidentally I recall, also, a large green mantis sitting in the top of a bush with a *strigosa* struggling in its clutches. I should have waited to ascertain whether it found its prey palatable, but, unfortunately, my time was too limited.

It has been claimed by Dr. Skinner (4) that almost no instances of birds capturing butterflies have been witnessed. The only place where a casual observer would notice such an occurrence would be in the open, where a bird might dash at a flying butterfly. But there must be countless more favorable opportunities when the butterfly is sluggish or torpid from cold, or when it has just emerged from the chrysalis, or is old and feeble with worn-out wings. If our field naturalists make it a point to look for these occurrences, we may gradually obtain a lot of illuminating data.

At a recent meeting of the Entomological Club of Los Angeles, following the reading of the preliminary notes of this article, a discussion of the attacks of birds upon butterflies

proved very interesting. Several members remembered having seen butterflies pursued and caught by swallows, sparrows and kingbirds.

Mr. S. J. Keese gave a very pleasing account of a chrysalis which he watched one day in his mill up in the mining country. A brown butterfly emerged, expanded to maturity, and finally flew out of the window only to be snapped up on the wing by a small flycatcher. Finally, Mr. F. Grinnell, Jr., called attention to an article by Harold C. Bryant on "The Relation of Birds to an Insect Outbreak in Northern California during the Spring and Summer of 1911" (7). In many ways this article is one of the most vitally interesting ever written when taken in connection with the subject of birds preying on butterflies. Mr. Bryant is a trained observer and writer, and was detailed by the California State Board of Fish and Game Commissioners to investigate a remarkable plague of caterpillars followed by a pest of butterflies (*V. californica*) in the northern counties of California, in 1911. His account is so interesting in every detail that it is difficult to refrain from quoting whole pages of it.

The salient features, from our point of view, are as follows: There was an enormous flight of medium-sized butterflies. Of the forty-five species of birds forming the population of this district, none of the smaller ones attacked the butterflies. Of the larger birds only four species preyed on them. Large flocks of red-winged blackbirds (*Agelaius phoeniceus*, subspecies) were in the immediate vicinity, but confined themselves almost entirely to vegetable food. But there was one species, Brewer's Blackbird (*Euphagus cyanocephalus*), which wrought havoc. Large flocks of these birds followed the butterflies, attacking them as they sat in crowded masses about the moist places in the roads and meadows. At the rate of destruction which he personally witnessed, Mr. Bryant computed that it was possible for each bird to destroy 480 butterflies each day, and, if one-third of these were females, the number of eggs destroyed might number 336,000 in a month. The whole article furnishes abundant food for thought. It is to be hoped

that many more observations of a like nature will be made in the near future, and that we shall finally be able to advance Bates' Theory to the dignity of a law.

It may be found that in our present day and generation *arthemis* and the other species of *Limenitis* are no longer used as food. This may not have been so in a past age. The formation of the *Limenitis* mimics may have taken place under conditions quite different from those of to-day. We may easily imagine that the progenitors of the present-day species were of one general form, possibly slow-flying and with other habits which made them an easy prey to birds. One branch may have developed protection by adopting a protective coloration, while the other found protection in a swift flight, quick, alert movements, and the adoption of wooded areas for their habitat. Argue as we may, the fact remains that the mimics exist and, so far, no reasonable explanation has been offered except that advanced by Darwin, Wallace and their followers—the survival of the fittest by natural selection.

In closing I wish to express my very great appreciation of Mr. F. Grinnell, Jr.'s, kindness in lending me all of the publications outlined in the following list of references:

(1) Transactions, Entomological Society of London. 1908. Parts III and IV. Mimetic North American species of the genus *Limnitis* (s. l.) and their models. By Edward B. Poulton, D.Sc., M.A., LL.D., F.R.S., etc.

(2) Transactions, Entomological Society of London. 1902. Part III. Nov. Five Years' Observations and Experiments (1896-1901) on the Bionomics of South African Insects, with plates of illustrations. By Guy A. K. Marshall, F.Z.S.

(3) Transactions, Entomological Society of London. 1908. Parts III and IV. Bionomic Notes on Butterflies. By G. B. Longstaff, M.A., M.D., F.E.S.

(4) Journal of the Acad. of Nat. Sci. of Philadelphia. Vol. XV. Second Series, March 21, 1912. Mimicry in Boreal American Rhopalocera. Henry Skinner, M.D., Sc.D.

(5) Annals of the Entomological Society of America. Vol. II, No. 4, Dec., 1909. Mimicry in the Butterflies of North America. Prof. E. B. Poulton.

(6) *Spolia Zeylandica*, Ceylon, Vol. V, Part XVIII, April, 1908. Mimicry in Insect Life as Exemplified by Ceylon Insects. By E. E. Green, F.E.S.

(7) The Condor, a Magazine of Western Ornithology, Vol. XIII, No. 6, Nov.-Dec., 1911. The relation of birds to an insect outbreak in Northern California during the spring and summer of 1911. By Harold C. Bryant.

Notes on Chilopoda from the Galapagos Islands.

By RALPH V. CHAMBERLIN, Museum of Comparative Zoology,
Cambridge, Mass.

A study of a small collection of Chilopods from the Galapagos Islands has revealed five species, of which one, *Scolopendra galapagoensis*, has been previously reported. Of these five species, the three geophiloids are well-known forms occurring widespread in the warm regions of both hemispheres, while the two scolopendroids, so far as now known, appear to be strictly indigenous. The *Cryptops* is here described for the first time.

Whether the geophiloids mentioned may have been introduced in recent times upon ships it is difficult to say; but it seems certainly entirely possible for them to have reached the islands through other agencies than that of man. The resistance of geophiloids to submersion in both fresh and salt water is strikingly greater than that of at least some scolopendroids, this being true not only of the so-called marine forms living normally between tide-marks, such as *Hydroschendyla*, and of those of littoral habit, such as *Pectiniunguis americanus*, but also of those of essentially terrestrial habit. This superior resistance of geophiloids has been experimentally demonstrated by Plateau* who found that, while *Cryptops punctatus* had but feeble resistance to submersion in sea water, being dead after a very few hours, *Geophilus longicornis* might, under favorable temperature conditions, survive complete submersion after removal of every trace of adhering air bubbles for from 12 to 72 hours; and, similarly, that while *Cryptops* might withstand a submersion in fresh water of 6 hours, *Geophilus longicornis* and *G. sodalis* might be alive after from 6 to 15 days. It is reasonable to suppose that the resistance of forms habituated to the littoral life and to consequent frequent submersions would be found to be materially greater than that of these terrestrial species, and that, were the submersion not continuous

* Plateau, Les Myr. marins et la Résistance des Arthropodes a respiration aërienne a la submersion. Journal de l'Anat. et de la Physiologie, Paris, 1890, 26, pp. 236-269.

but intermittent, as would be the case were the specimens afloat upon drift, these might remain alive for very prolonged periods.

GEOPHILOIDEA.

FAMILY SCHENDYLIDAE.

Pectiniunguis americanus Bollman.

One female from Albemarle Island with 61 pairs of legs.

The occurrence of this species on the Galapagos Islands is not surprising, because of its littoral habits and prevalence about the Mexican coasts under piles of driftwood, etc., upon which it might easily be carried long distances by ocean currents.

FAMILY MECISTOCEPHALIDAE.

Mecistocephalus punctifrons Newport.

Two specimens from Clipperton Island.

This is a very widespread species occurring upon the Madeiras, the Bermudas, the West Indies, in Central and South America, as well as in India and the East Indies, etc. It has been recorded in part as *M. guildingi* Newport.

FAMILY ORYIDAE.

*Orphnaeus bilabiatu*s (Newport).

One female from Hood's Island agreeing in all essentials with Central and South American specimens. A very common geophiloid in tropical America, as well as in the Hawaiian Islands, Japan and the East Indies. It has also been recorded as *O. lineatus* (Newport), *O. brasilianus* (H. & S.) and *O. brasiliensis* Meinert.

SCOLOPENDROIDEA.

FAMILY SCOLOPENDRIDAE.

Scolopendra galapagoensis. Bollman.

Specimens from Hood, Chatham, Bindloe, Narborough and Albemarle Islands.

The dorsal spines at the distal end of the prefemur of the twentieth legs vary from 5 to 9 in number, those on the immediately preceding pairs from 5 to 6, while on the anterior pairs the number is nearly always 4.

FAMILY CRYPTOPIDAE.

Cryptops navigans sp. nov.

Color yellow or yellow of dilute ferruginous cast.

Head widest near middle, from where the sides, which are convex, converge strongly caudad, more abruptly so toward corners, and also cephalad; the anterior margin convexly rounded, a little indented at middle; caudal margin straight. Sulci not evident. Hairs of moderate length, sparse.

First dorsal plate with a distinct, transverse cervical sulcus well removed from the margin of head. The sulcus is angularly bent back toward the middle, though narrowly rounded at median line. There are no paired longitudinal sulci, but there is a median longitudinal furrow as on subsequent plates.

No paired sulci evident on second plate, but these are traceable on the third and become more distinct caudad. Last plate apparently without a median sulcus.

Prosternum not manifestly punctate; without furrows. Anterior margin convex, slightly indented at middle line; bearing no bristles, but a pair of these borne one each side of median line a little distance caudad of the margin. Bristles of general surface sparse.

Ventral plates not manifestly punctate in the types. Last ventral plate with sides convex, more strongly rounding toward and about the caudal corners; caudal margin widely weakly convex or substraight across the median portion.

Coxopleurae ectocaudally subtruncate, the inner portion of caudal margin extending obliquely mesocephalad to inner edge. Bearing along caudal edge several spines and toward mesal border two or three long stout spinescent bristles.

Spiracles of medium size; circular.

Tarsi of anterior legs uniarticulate, or not movably articulate. Not armed with spines. Hairs sparse.

Prefemur of anal legs with numerous spines over surface, a longitudinal smooth area on mesal surface. Femur similarly armed, but with spines fewer on and toward dorsal surface, where they are replaced by simple hairs; also bearing on ventral surface toward distal end a single acute tooth. Tibia bearing on mesal side three spines and on ventral surface a longitudinal series of four teeth, which increase in size distad; otherwise bearing simple hairs. First tarsal joint bearing ventrally two teeth, of which the more distal is much the larger, otherwise clothed with simple hairs. Second tarsal joint bearing only hairs.

Length, 11 mm.

Locality.—Clipperton Island. Two specimens.

Noteworthy Variations in the Elytral Tracheation of *Cicindela* (Coleop.).

By VICTOR E. SHELFORD, Chicago, Ill.

The elytral tracheation of the *Cicindela* has been observed by the writer in about one hundred species. The elytra of the newly emerged imagoes of ten North American species have been studied in some detail. Nearly all the common North American species and about fifty exotic species have been studied in less detail by mounting dried elytra in hot canada balsam containing little or none of the usual solvents. The main tracheal trunks and some of the branches remain clearly visible in such mounts for several hours.

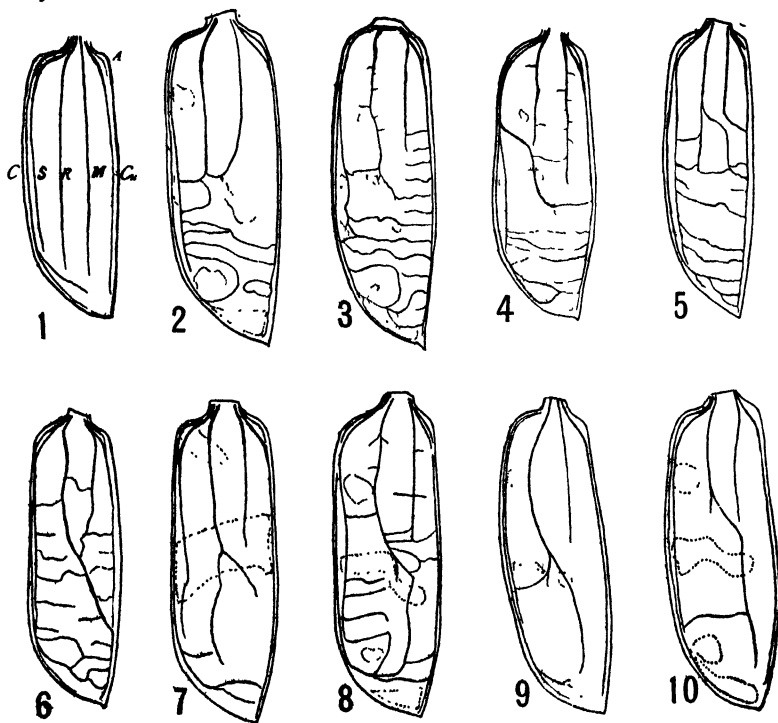


Fig. 1.—Typical arrangement of the main elytral trunks.

2.—Variation of rare occurrence in *C. limbatis* Klg.

3, 4, 5 and 6.—Tracheation of *Cicindela punctulata* Oliv., showing posterior bendings and branching of the radius, the substitution of cross for longitudinal tracheae, and (in 4) a posterior branching of the subcosta.

7.—*C. princeps* var. *ducalis* Horn (India); 8.—*C. limbatis* Klg.; 9.—*C. campestris* Linn. (Europe); 10.—*C. silvicola* Dej. (Europe).

In terms of the system of classification proposed by Comstock and Needham*, the usual tracheae present (Fig. 1) are the costa (c) which branches near its distal end and subcosta (s) which lies close to the costa on the outer edge of elytron; the radius (r), and media (m) which lie in the median portion of the elytron; the cubitus (cu) which lies along the suture and (a) the anal rudiment which lies next to the scutellum.

Deviations from the type shown in figure 1 are not numerous, though in occasional individuals a number of large cross tracheae takes the place of the posterior portions of the radius and media as shown in figures 2, 3, 4, and 5. One of the main trunks occasionally crosses over to the region of the next nearer the suture (posteriorly). Branchings in this direction are commonest in other orders. This is shown in figures 4, 5, 8, 9, and 10. Bendings toward the outer margin of the elytron are rare; figure 2 (*C. purpurea limbalis* Klg.) shows the only one noted.

Comstock and Needham, Part II, page 85, state that the main stem of the radius, the most prominent vein of the wing, usually separates into two main branches. In the *Cicindelid* elytra, the radius is most variable. Branching in the middle third of the elytron is evidently common (Figs. 7, 8, 9, and 10.). The commonest type is shown in figure 7. About five per cent. of the elytra of *C. punctulata* Oliv. show such variations. It has been found in *C. princeps* var. *ducalis* Horn (India) (fig. 7; *C. silvicola* Dej. (Europe) (fig. 10); *C. campestris* (Europe) (fig. 9); *C. tenuipes* Dej. (India); *C. pamphilia* Lec., and *C. dorsalis* Say, as well as several other species of *Cicindela* noted before definite records were kept.

If the third elytral trachea is rightly homologized with the third of the wings of other orders, its tendency to branch seems quite remarkable in view of the specialized conditions of the wings concerned. Presumably this represents a reversion to some ancestral type. It is likewise of considerable interest to note the possibility of studying the physiological causes of such divisions and of other variations in connection with the development of the wings.

* American Naturalist, 1899, pp. 43, 81, 231, 335, 413, 561, 769, 903.

Notes on *Tomoxia bidentata* Say and *lineella* Lec. (Coleop.).

By C. A. FROST, Framingham, Mass.

In the Coleoptera of Indiana, page 1311, the statement is made that *Tomoxia lineella* "is now recognized as the male of *bidentata*." Mr. Blatchley informs me that this statement is founded, in part at least, on a note by Mr. Linell in *Entomologica Americana*, Vol. III, page 171, and a letter from the late Prof. J. B. Smith, in which he expresses this belief.

Mr. Linell's note records the fact that he took a series of *bidentata* on a certain log and the next year a series of *lineella* on the same log, but does not explain just how this indicates specific identity. He also mentions the shape of the palpi in *lineella* as suggesting the male.

The suppression of a species on such evidence is entirely unwarranted, to say the least, and I offer the following notes to show that *lineella* differs not only specifically but also in one important character that has been used, with others, to separate allied genera. (Synop. Mordellidae of U. S. by John L. LeConte, M.D., Proc. Acad. Nat. Sc., Phil., 1862, p. 43.)

I refer to the fact, which I have not been able to find in print, that the eyes in *lineella* extend to the posterior margin of the head. I have examined about ten specimens, including the type of this species and also the type of *inclusa* which agrees with *lineella* in this character.

In addition to this generic character it will be seen that, in *lineella*, the anal style is longer and more slender, the apices of the elytra are separately rounded and with a distinct margin, and that the sutural angles are not mucronate.

In *bidentata* the elytral apices are obliquely truncate without distinct margin, and with the sutural angles prolonged in a short spine. The posterior margin of the eye is separated from the posterior margin of the head by a relatively broad pubescent area, which is interrupted near the upper part of the eye by a triangular, glabrous area having the upper side limited by a slight arcuate ridge and having the posterior apex of the triangle extending to the posterior margin of the head.

This area, which is not due to denudation, is somewhat variable and in some females borders the posterior margin of the head for at least a millimeter. There are many other less obvious differences, but the above characters will be sufficient to separate the two species at once.

It may be mentioned here that, while the figure of *lineella* given on Plate I, fig. 28, Synop. of the Mordellidae by John B. Smith in Trans. Amer. Ent. Soc., Vol. X, 1882, is a correct representation of the first specimen in the LeConte Cabinet, all the others in the type series, and all the specimens I have seen, have the outer rows of pubescence nearly obliterated except at a point slightly behind the middle, where they form a quadrate spot that becomes the most distinctive feature of the ornamentation.

Through the kindness of Mr. F. W. Dodge, of Melrose, Mass., I have been able to examine nearly one hundred adults of *T. bidentata* and also the larvae and the pupae.

The males of this species can readily be separated by the more pronounced arcuation of the front tibia, the inner face of which is set with erect hairs; these become distinctly setaceous near the apex, which is noticeably enlarged when viewed from in front. The lower edge of the front femora, in the males, is fringed with long cinereous hairs and the maxillary palpi are also clothed with longer pubescence. All these male characters, except the enlarged distal end of the front tibiae, hold good in my limited series of *lineella*. There are other slight differences in the shape of the tip of the anal style, last joint of the palpi, and the joints of the antennae.

Larval characters.—One of the larvae given me shows signs of having been near pupation when placed in the alcohol. The other is yellowish white, cylindrical, slightly arcuately bent, and measures 19 millimeters from the mandibles to the tip of the anal process. The head, which is narrower than and retracted into the first thoracic segment, is sparsely covered with slightly darker granulations, each bearing a yellowish hair. The mandibles are nearly black at the tips, becoming light brown toward the bases. The front has a slight median sulcus from above the clypeal area to the occiput. With my limited optical instruments, the antennae appear to be four-jointed, proceeding from a large fleshy tubercle; the first joint is short, slightly smaller than the

basal tubercle; the second is slightly longer, much narrower, the ~~base~~ brownish; the third is still narrower, brownish, and longer than the second; what I have called the fourth joint seems to be two minute yellowish processes.

The first thoracic segment has a darker, transverse, dorsal line with the ends near the front margin on each side and extending arcuately backward and terminating in two flat, irregular elevations on each side of the middle near the posterior margin of the segment. On the ventral side of the segment, between the legs, there is an area covered with stronger granulations and coarser hairs. In front of the legs there is a fleshy fold that has the appearance of a separate segment as the limiting ruga extends completely across the under side.

The legs are short conical processes, with vague joints, projecting from large udder-like tubercles.

The sutures between the thoracic segments are deep, and the second and third segments are obliquely wrinkled at the sides and again on the disk; the two latter rugae form an anterior dorsal lobe. The anterior stigmata are plainly visible between the first and second segments.

All the abdominal segments are sparsely covered with hairs, which are more evident on the under side, projecting from distinct granulations of a darker color. These granulations become darker brown and more pronounced on a small median area of the ventral portion of the eighth and ninth abdominal segments. Dorsally and laterally the ninth (anal) segment is covered with strong, dark brown asperities, each bearing the usual hair, and increasing in length toward the apex which is tipped with a horny projection that suggests the cremaster of certain lepidopterous pupae. This appears to be built out by extreme elongations of these asperities and is triangulately emarginate at the apex. This dark brown projection is more than half a millimeter in length.

Pupa.—The pupa is straight and measures from 12 to 14 millimeters in the series before me. The head is sparsely set with projecting granulations or asperities. On the prothorax they are less numerous except at the posterior angles. The wings are set with rows of these elongated granulations placed on distinct and parallel costae. The abdominal segments have irregular patches of these granulations, two dorsal, two smaller sub-dorsal, two larger lateral, and below the last an irregular row which is broadly interrupted at the ventral center of the segments. The anal style is also sparsely set with asperities. The tip of the abdomen has two divergent fleshy tubercles.

Occurrence and habits.—The following records of capture are at hand: Several *bidentata* were taken on a dead elm at Medford, Mass., June 30 and July 15, 1903. Nine *bidentata* were taken on a dead beech at Monmouth, Maine, June 29, 1912. On this tree I saw a pair *in copula*. Six *lineella* were

~~taken~~ on a dead (beech?) tree at Monmouth, June 27, 1906. This tree was within a few hundred feet of the tree previously mentioned. One *lineella* was taken on a pile of slabs at Monmouth, June 22, 1910.

It has been my experience that both species are very wary and hard to capture. I have waited an hour for them to return to the tree from which they had been driven.

From a paper which Mr. Dodge has very generously placed in my hands, I quote the following notes on *T. bidentata*: "Most of the captures were made on the trunks of several dead oak trees and they could not be found on other trees nor on oaks with any appearance of life. They are very quick to take wing but rarely go more than a few feet, in fact they seem reluctant to leave the particular tree on which they are found.

On the 30th of June it was discovered that they were emerging from the fungus-covered stump of a decayed oak. With the help of a hatchet and knife, larvae, pupae, adults, and a probable hymenopterous parasite were uncovered. The larvae appear to pass most of their life in the more solid, central part of the stump, but when they are ready to pupate they work their way into the more decayed outer wood and there excavate a pupal chamber which they line with a soft whitish substance. These pupal chambers were frequently found from four to six inches from the surface, but on account of the soft condition of the wood the adults probably had no difficulty in reaching the outer air."

Mr. C. T. Brues has determined the supposed parasite as *Arotes amoenus* Cresson.

The Vote on Priority in Nomenclature.

Since our last announcement on this subject (ENT. NEWS, November, 1912, page 423), a "better late than never" vote "that the law of priority should be strictly applied in all cases," has been received from Mr. J. R. de la Torre Bueno. The total vote taken by the NEWS now stands 99 for strict priority and 197 against. *Science*, in its issue of December 13, 1912, reported the vote of the Central Branch of the American Society of Zoologists as 13 in favor of strict priority and 35 against, followed by an elaborate analysis of the vote.

A New Form of *Hemileuca burnsi* (Saturn., Lap.).

J. HENRY WATSON, Withington, Manchester, England.

H. burnsi ab. *paradoxa* n. ab.

Abdomen less black than typical *burnsi*, with the first two segments above heavily sprinkled with reddish hairs. (Other females of *burnsi* also have these reddish hairs in a less degree.) Ground color of all wings very pale buff, not white. The apex dark lilac-brown in color, more heavily marked. The costal margin lightened between the two black bands by having long white hairs interspersed; the outer margin beyond the sub-marginal stripe darkened with the same scales as apex.

Hind wings similarly (though less heavily) marked beyond the black marginal line. Fringes of wings color of apex and showing as a dark line. (I have a female of typical *burnsi* which has the margins of wings black and fringes white).

Wings below similar but more heavily marked than above; the whole of hind wings being this lilac-brown color, which resembles almost the shade of heavily-marked specimens of male *Euleucopheas oliviae* (Ckll.), which, however, have always noticeably pale fringes.

Type.—One female emerged from a two-year pupa, Sept. 27, 1912. Taken at Reno, Nevada. In coll. J. Henry Watson.

What can be the reason of such a variation I do not know, unless it may show the affinity to *Euleucopheas oliviae* and *tricolor*, but from which *H. burnsi* and *neumoegei* (Edw.) may be at once separated by the shorter antennae of the male.

Since this specimen emerged, I at once examined my series of *burnsi*, which is a fairly long one; and I find one or two specimens have just a few scattered scales of this color on the upper surface, near the post-discal black line, and with the under surface darkened chiefly on veins with these smoky lilac scales, all being females.

Photographs of Entomologists desired.

The Entomological Section of the Philadelphia Academy of Natural Sciences desires for its entomological album the photograph of every entomological student. The collection contains over 300 at this date. A list was published in the *News* 1902, pages 45-47, of those in the album at that time. We hope that those who can do so will write their names and date of birth on the back of each photo, along with any other information concerning themselves they may wish to impart.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without charge in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., MARCH, 1913.

An eminent zoologist wrote, many years ago:

The anatomical error in reference to the auricles of Reptiles and Batrachians on the part of Linnaeus [cor uniloculare, uniauritum] is extremely interesting, since it shows to what an extent the most patent facts may escape the observation of even the greatest observers, and what an amount of repeated dissection and unprejudiced attention has been necessary before the structure of the commonest animals has become known. . . .

It is astonishing how many good observers it requires to dissect and draw and record over and over again the structure of an animal before an approximately correct account of it is obtained *

If these remarks be true concerning the acquisition of anatomical truth, how much more strongly must similar reflections apply to the ascertainment of physiological fact. The honey or hive bee, through its partial domestication by man, must surely be reckoned among the commonest insects; its structure and its habits have been repeatedly described by observers in different countries. Yet, according to the recent publications of Dr. D. B. Casteel,† the conceptions hitherto prevailing as

* E. R. Lankester, art. Zoology, Encyc. Brit., 9th edit., Vol. XXIV, p. 806. 1888.

† The Manipulation of the Wax Scales of the Honey Bee. By D. B. Casteel, Ph.D. Circular No. 161, Bureau of Entomology, U. S. Dept. of Agriculture. Issued October 4, 1912.

The Behavior of the Honey Bee in Pollen Collecting. By D. B. Casteel, Ph.D. Bulletin No. 121 of the same. Issued December 31, 1912.

to the manner in which the pollen-baskets of the workers are loaded, the structures concerned, and the supposed use of the "wax-shears" are largely false. The marvelous modifications of the worker's legs, apparently so well adapted to her various functions, remain as marvelous as before, but they are employed in quite other ways than those in which they have been believed to act.

If such a revolution in the interpretation of the functions of an insect so well known as the hive bee can take place in this day and generation, how many other supposed facts may be overturned as the commoner insects are more and more intensively studied. This concrete case of the honey bee, as exemplified by Dr. Casteel's results, ought surely to be a warning to those who hold that, because one investigator is engaged on a certain piece of research, it is useless and a waste of time for another student to devote his time and energies to the same subject.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

The Harlequin Cabbage Bug in Iowa. (Hemip.).

Being unable to find a record of the occurrence of *Murgantia histrionica* Hahn, in Iowa, the following note may be of interest.

In October, 1911, a male and a nymph of this species, the latter about half grown, were found along a small creek near Iowa City by O. W. Rosewall. There were several truck patches in the vicinity, in some of which cabbage and other cruciferae were grown, but no damage from these bugs has yet been reported in this locality.

Chittenden (Circular No. 103, U. S. Department of Agriculture, Bureau of Entomology) says: "This species has obviously become diffused from a central point of dispersal, Mexico, chiefly in the following three directions: (1) From Texas eastward through the Gulf States and northward along the Atlantic seaboard to Long Island; (2) from Texas northward through the Mississippi Valley and thence through the Ohio River region into Ohio; (3) from Mexico into the neighboring States and Territories, and from Lower California into Southern California and Nevada."

This is, I believe, the first Iowa record of the pest and shows that, although it is not common here, the range is gradually being extended through the Mississippi Valley.—DAYTON STONER, State University of Iowa.

**United States Civil-Service Examination for Scientific Assistant.
Department of Agriculture.**

The United States Civil Service Commission invites attention to the regular spring examinations for scientific assistant, Department of Agriculture, to be held April 9 and 10, 1913, at the principal cities of the States. Entomology is among the subjects given, and persons desiring to be examined should apply to the United States Civil Service Commission, Washington, D. C., or to the secretary of the board of examination at the places of examination, for application and examination form 1312, using the exact title as given at the head of this announcement in making application. Application should be made in ample time as soon as possible before the date of examination.

The Adams Collection of Lepidoptera.

This exceedingly rich and very extensive collection [of Exotic and Palaearctic Lepidoptera, formed by the late Herbert Jordan Adams (1838-March 1, 1912), of Roseneath, Enfield, England, said to be particularly rich in *Ornithoptera* and other fine Rhopalocera] is now installed in the Natural History Museum at South Kensington. It is contained in sixty-eight cabinets and numerous store-boxes. The number of specimens probably totals something like 150,000, among which are hundreds of types—*The Entomologist's Monthly Magazine*, Oct., and *The Entomologist*, Dec., 1912.

Two New Generic Names in Muscoidea (Dip.)

I am indebted to Professor T. D. A. Cockerell for advising me that the generic names *Oestropsis* and *Protogonia*, used by me in my recently published paper, entitled "New Genera and Species of Muscoid Flies from the Andean and Pacific Coast Regions of South America" (U. S. N. M., 1912), are preoccupied. I hereby propose *Euoestropsis* n. n. for the former, and *Protogoniops* n. n. for the latter. The synonymy will stand as follows:

EUESTROPSIS Townsend, 1913.

Syn. *Oestropsis* Towns., 1912 (non Brauer, 1868; non Smith, 1868).

PROTOGONIOPS Townsend, 1913.

Syn. *Protogonia* Towns., 1912 (non Cope, 1881).—CHARLES H. T. TOWNSEND.

Bromeliadicolous Insects.

The insect fauna of epiphytic bromeliads, which in this country has been discussed by Knab, Alexander, Malloch, Calvert and others, has been receiving attention recently in Europe. Señor C. Picado, of Costa Rica, now in Paris, in the *Comptes Rendus* of the Academy of Sciences

for 1911 (tome cliii), has compared the water-containing epiphytic bromeliads to a great fragmented swamp or marsh extending throughout intertropical America and discusses their biological characteristics in general. Mr. Hugh Scott, curator in Entomology in the University of Cambridge, has given an account, in the *Annals and Magazine of Natural History* for October, 1912, of bromeliadicolous insects of the islands of Trinidad and Dominica, which he collected in March, 1912. Mr. G. C. Champion, of the *Biologia*, has re-examined some of the bromeliadicolous Coleoptera of Costa Rica collected by Calvert and studied material received from Señor Picado, finding that 12 families are represented by those hitherto and now recorded (*Entom. Mo. Mag.*, January, 1913). Additional Orthoptera (a Blattid described by Shelford in Mr. Scott's paper) and Hemiptera (a *Microvelia*, by Distant in the same, and a Lygaeid by Mr. Champion), are also made known as members of this fauna.

Still more recently Señor Picado has described (*Bull. Soc. Zool. France*, XXXVII, No. 10. Jan. 31, 1913) a new species of *Scirtes*, *S. championi*, and its larva, which he reared from among the leaves of Costa Rican bromeliads. This insect is a member of the Coleopterous family Dascillidae.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues, which are generally dated the year previous.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

4—The Canadian Entomologist. 7—U. S. Department of Agriculture, Bureau of Entomology. 9—The Entomologist, London. 11—Annals and Magazine of Natural History, London. 13—Comptes Rendus, Societe de Biologie, Paris. 14—Proceedings, Zoological Society of London. 22—Zoologischer Anzeiger, Leipzig. 38—Wiener Entomologische Zeitung. 50—Proceedings, U. S. National Museum. 51—Novitates Zoologicae, Tring, England. 69—Bollettino, Societa Italiana Entomologica. 76—Journal, Cincinnati Society of Natural History. 84—Entomologische Rundschau. 89—Zoo-

logische Jahrbucher, Jena. 94—"Das Thierreich" herausgegeben von d. Deutschen zoologischen Gesellschaft, Berlin. 102—Proceedings of the Entomological Society of Washington. 110—Bulletin, Societe d'Histoire Naturelle de Colmar. Nouvelle Serie. 119—Archiv für Naturgeschichte, Berlin. 136—Stettiner Entomologische Zeitung. 148—New York Agricultural Experiment Station, Geneva. 152—California Agricultural Experiment Station, Berkeley. 166—Internationale Entomologische Zeitschrift, Guben. 175—Aus der Natur, Berlin. 189—Pomona Journal of Entomology, Claremont, Cal. 199—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. 216—Entomologische Zeitschrift, Frankfurt a. M. 220—Anales, Sociedad Cientifica Argentina, Buenos Aires. 302—Mitteilungen Naturwissenschaftlichen Vereins an der Universität Wien. 310—L'Echange. Revue Linneene. Moulins. 313—Bulletin of Entomological Research, London. 324—Journal of Animal Behavior, Cambridge, Mass. 327—Scientific Memoirs by Officers of the Medical and Sanitary Departments of the Government of India (new Ser.), Calcutta. 344—U. S. Department of Agriculture, Washington, D. C. 359—Connecticut Agricultural Experiment Station, New Haven. 369—Entomologische Mitteilungen. Berlin-Dahlem. 381—Experiment Station Record, Washington, D. C. 408—Dominion of Canada, Department of Agriculture, Experimental Farms. Division of Entomology, Ottawa. 411—Bulletin of the Brooklyn Entomological Society. 414—Transactions of the Norfolk and Norwich Naturalists' Society. 415—Boletin de Fomento, Organo del Ministerio de Fomento, San Jose, Costa Rica. 416—Revista de Ciencias, Lima, Peru. 417—University Studies, Lincoln, Nebraska. 419—The Philippine Agricultural Review, Manila.

GENERAL SUBJECTS. Anon.—Economic entomology, 381, xxvii, 655-663. Proposte della commissione per la nomenclatura zoologica italiana nominata dall'assemblea di bromio della Unione Zoologica Italiana 1908, 69, xliii, 238-45. Britton, W. E.—Report (12th) of the state entomologist of Connecticut, 359, Report 1912, 209-96. Cameron, P.—Obituary, 9, 1913, 24. Dewitz, J.—The bearing of physiology on economic entomology, 313, iii, 343-54. Fritsch, W.—Stimmungsbilder aus dem Jahre 1912, 84, xxx, 1-3. Hamann, W.—Ueber die einrichtung und den betrieb kleiner insektarien, 166, vi, 271-73. Hammond, J.—An investigation concerning the food of certain birds, 414, ix, 316-327. v. Hanstein, R.—Biologie der Tiere. Verlag von Quelle & Meyer, Leipzig, 1913, 404 pp. Hewitt, C. G.—Legislation in Canada to prevent the introduction and spread of insects . . . destructive to vegetation, 408, Bull. No. 6. Knab, F.—Blood-sucking insects as transmitters of human disease, 102, xiv,

219-21. **Knorzer, A.**—Deutschlands wärmste gegenden und ihre insektenfauna, 110, xi, 1-24. **Lyman, H. N.**—The second international congress of entomology, 4, 1912, 370-71. **McAtee, W. L.**—Index to papers relating to the food of birds by members of the biological survey, 344, Biol. Sur., Bul. No. 43. **Mitzmain, M. B.**—Collected notes on the insect transmission of surra in carabaos, 418, v, 670-81. **Pantoja, R.**—La tiriassia en los animales domesticos, 415, ii, 708-713. **Poche, F.**—Die bestimmung des typus von gattung ohne ursprunglichen solchen, . . . 119, 1912, A. Heft 8, 1-110. **Schoenichen, W.**—Ueber diapositive fur den naturgeschichtlichen unterricht, 175, ix, 262-265. **Schroder, E.**—Zur geschichte der zoologischen und botanischen nomenklatur im 19 Jahrhundert, 175, ix, 232-239. **Viereck, H. L.**—Entomology at the centenary of the Academy of Natural Sciences of Philadelphia, 102, xiv, 193-94. **Weiss, H. B.**—Some ancient beliefs concerning insects, 411, viii, 21-23.

ARACHNIDA, ETC. **Hilton, W. A.**—A preliminary study of the central nervous system of spiders, 189, iv, 332-36. **Quayle, H. J.**—Red spiders and mites of citrus trees, 152, Bul. 234.

Roewer, C. F.—Die familie der Cosmetiden der Opiliones-Lanitores, 119, 1912, A, H. 10, 1-122.

APTERA AND NEUROPTERA. **Hodge, H.**—Dragonflies bred in 1912, 9, 1913, 17-18. **Morrill & Black.**—White flies injurious to citrus in Florida, 7, Bul. 92. **Tovar, F. D.**—Contribucion al estudio de los afanipteros de Lima y callas. (Continuation.) 418, xv 193-196 (cont.). **Williams, C. B.**—Some biological notes on "Raphidia maculicollis", 9, 1913, 6-8.

Bacon, G.—Some Collembola of Laguna Beach, 189, iv, 841-45.

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INSECUTOR INSCITIAE MENSTRUUS.—A Monthly Journal of Entomology, Vol. I, No. 1, January, 1913. Conducted by Harrison G. Dyar, 1512 21st St., N. W., Washington, D. C. The title in large type is very imposing, but at first glance suggests nothing of an entomological journal. The English title conveys more to the illiterate. However this may be, *Scientia est potentia* or, in vulgar parlance, knowledge is power and this is a *menstruus*, or monthly, and persecutes ignorance twelve times a year, unless there should happen to be a miss. The publication "is undertaken in memory of Augustus Radcliffe Grote, the best lepidopterist of America, living or dead, whose writings have always been to me a model and an inspiration." The modesty of the conductor is quite overwhelming. The model, "The North American Entomologist," on which the present Journal is based, was discontinued at page 104. The Conductor of the *Menstruus* says, "We hope to conduct this on the same lines." "Whether it lasts longer or not remains to be decided." There are one dozen pages in the first part, devoted to a very good paper, entitled "Notes on Cotton Moths" (Lepidoptera, Noctuidae). By Harrison G. Dyar. The *Menstruus*, as the name indicates, comes out monthly, sold by subscription, \$2 a year in advance, payable to the Conductor. The price seems high, but no one can tell in advance how much ignorance may be persecuted monthly.—H. S.

PSYLLIDARUM CATALOGUS. Auctore Dr. G. Aulmann. (W. Junk, Berlin W. 15.) 1913.

We are glad to see a catalogue of the Homopterous family Psyllidae, and published by the well-known firm of W. Junk, of Berlin. It is gotten up in the same style as the *Coleopterorum Catalogus*, which is now becoming familiar to coleopterists. This catalogue includes the species of the world and is complete in 92 pages. It will certainly prove of value to students of that family and they should know of its existence.

Doings of Societies.

FELDMAN COLLECTING SOCIAL.

Meeting of May 15th, 1912, at 1523 S. 13th St., Philadelphia; fourteen members were present; Pres. Haimbach in the chair.

Mr. Wenzel, Sr., recorded *OEdionychis fimbriata* Forst. from Iona, IV-27, as new to southern New Jersey.

Mr. Laurent said if corks were dipped in ~~paraffine~~ the crevices would be filled and they would make better stoppers for the bottles and could be easily removed.

Mr. Daecke said it is a remarkable year for insects about Harrisburg. He exhibited two species of the Lepidopterous family Thyatiridae: *Euthyatira pudens* Gn., Rockville IV-24-'12 and *Habrosyne scripta* Gosse, Conewago VIII-14-'09 and stated that these species, though conspicuously colored, were very difficult to find owing to their similarity to the form and color of the surroundings which they select for resting on. He recorded the Noctuid, *Baileyia ophthalmica* Gn., Harrisburg V-10-'12. He further exhibited a pair of *Criorhina nigriventris* Walton (Dip.), taken at Rockville, IV-28-'12, and spoke of their likeness to the bumble-bee in flight, general appearance and buzzing. He also pointed out the difference between this species and *C. verbosa* Wlk., the latter species having been rather common this season. Two specimens of *Sthenopsis argentcomaculatus* Harr. (Lep.) were also shown which were reared from the bases of Alder (*Alnus*). The larvae were found by Mr. Champlain, near Harrisburg, in March, this season, and the adults emerged May 7th and 8th. There were six larvae alongside each other in as many borings in one Alder stick about two and one-half inches in diameter, which could be easily seen in the stem shown.

Dr. Skinner said he had collected the latter species at Lloydminster, north Saskatchewan, VII-31, and also recorded *Lithocolletes propinquinella* Braun (Lep.) Ardmore, Pa., V-5-'12.

Mr. Geo. M. Greene exhibited a pair of *Abia americana* Cress. (Hym.) collected at Castle Rock, Pa., IV-21-'12, by C. T. Greene. Also read an article on collecting insects by Anna Van Rensselaer Morris. This clipping was from the North American Monthly Magazine, May 12th, 1912, and was typical "newspaper entomology."

Dr. Skinner said while looking over the *Dorcus* in the American Entomological Society collection he noticed that

in *parallelus* the mandibular tooth is perpendicular, while in *brevis* it is horizontal and parallel to the mandible.

Adjourned to the annex.

Meeting of November 20th, 1912, at 1523 S. 13th St., Philadelphia; twelve members present; President Haimbach in the chair.

Mr. J. Wagner Green, of Easton, Pa., was elected an active member of the Social.

Mr. Wenzel exhibited two interesting boxes of Chrysomelidae including *Odontota*, *Cassida*, etc., remounted and rearranged.

Mr. Kaeber exhibited *Heteroceris brunneus* Melsh. (Col.) from Phila. Neck, VII-4-'12, which he had caught by throwing water on the mud banks, after which they could be seen as they leave the ground and easily captured and are apparently dry when taken.

Mr. Laurent exhibited eggs of a Neuropteran fastened to a leaf, Mt. Airy, Pa., VI-24. These were identified by Mr. Daecke as a "lace wing," *Chrysopa* sp.

Adjourned to the annex.

The twenty-fifth annual meeting was held December 18th, 1912, at 1523 S. 13th St., Philadelphia; eight members were present; Vice-president H. A. Wenzel in the chair.

Letters of congratulation on the Social's reaching the quarter century mark were read from Dr. Calvert and C. T. Greene.

Prof. Calvert exhibited some Costa Rican Odonata of the genus *Thaumatoneura* collected by himself. He stated that they were water-fall dwelling insects and he had caught them only at three falls of the several visited. Where they were missing he had noticed lizards about and as they are slow-flying insects this might account for their absence. A pair of each of two species (caught in coitu) were shown and while great differences were easily seen in the males, it was almost impossible to distinguish the females of *T. pellucida* and *T. inopinata*.

Mr. Wenzel exhibited several specimens of *Phanaeus carni-*

fer Linn. (Col.), all males, showing great variation in size. Some of the smaller ones had the thoracic horn entirely absent.

Mr. Daecke showed a root of "Clot bur" (*Xanthium strumarium* Linn. from which he had bred the weevil *Barts interstitialis* Say (as determined by Col. Casey). These specimens had emerged in the fall and then crawled back in the gallery made by the larvae, showing that they hibernate in the adult stage. The plant is common on the islands in the Susquehanna River.

Dr. Skinner said he had been working on the *Hesperiidae* and found one group, the "black skippers," very difficult to determine from the descriptions. He has kept all the specimens he has received in this family and now without doubt the American Entomological Society has the finest collection of them in the world.

Mr. Geo. M. Greene exhibited a specimen of *Polypleurus geminatus* Sol. (Col.) collected by himself under chips at East Falls Church, Virginia, XII-7-'12. This genus was discussed at the November, 1911, meeting.

Adjourned to the annex.

GEO. M. GREENE, *Secretary*.

ENTOMOLOGICAL SECTION, ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

Meeting of November 21, 1912. Mr. Philip Laurent, Director, presided. Ten persons present.

Mr. Rehn made a communication on the recent field trip made by Mr. Hebard and himself to the Florida Keys and Texas. Three months, June 29th to October 29th, were spent in the field and a series of over fifteen thousand Orthoptera, the particular object of the trip, as well as some hundreds of other insects, were secured. The speaker outlined the trip and discussed the features of collecting in portions of the country traversed. The objective points in Texas were the Brownsville region and the Chisos mountains in the bend of the Rio Grande, both of which were examined, while over fifty other

localities were visited. A number of photographs illustrating the talk were shown.

Dr. Calvert asked whether the Florida Keys species were largely West Indian. Mr. Rehn said they were about equally divided between West Indian and mainland forms.

Mr. Laurent exhibited a female specimen of *Papilio philenor*, in perfect condition, which he captured at Mt. Airy, Philadelphia, on November 1st of the present year. The speaker stated that this was an unusual time for this species to be found on the wing, and that no doubt some unusual cause had something to do with the appearance of the butterfly at this time of year. Mr. Laurent also exhibited prepared cabinet specimens of the larvae and chrysalids of the six species of *Papilio* known to breed in Pennsylvania.

Dr. Skinner exhibited both sexes of *Lycaena neurona*, an interesting little species, found so far only in California.

Mr. R. C. Williams was elected an Associate.

— — — — —

Meeting of December 9, 1912. Mr. Philip Laurent, Director, presided; nine persons present.

Mr. Rehn exhibited a series of specimens of the sub-family Proscopinae of the Acrididae, belonging to the Academy, largely from Argentine material sent for study. Many of these were very rare in collections. Dr. Calvert called attention to their remarkable resemblance to Phasmidae. Mr. Rehn pointed out the anatomical differences between the two families.

Mr. Hornig said he had found larvae of *Culex pipiens* out of doors on November 30th, and that Culicid larvae mature much faster in dirty water than in clean, and that more males than females were bred from clean water.

The following persons were elected to serve as officers for the year 1913: Director, Philip Laurent; Vice-Director, H. W. Wenzel; Treasurer, E. T. Cresson; Conservator, Henry Skinner; Secretary, J. A. G. Rehn; Recorder, Henry Skinner; Publication Committee, E. T. Cresson and E. T. Cresson, Jr.

Mr. Jacob Kotinsky was elected an Associate.

HENRY SKINNER, Recorder.

Franklin A. Merrick.

Mr. Franklin A. Merrick, of New Brighton, Pennsylvania, died at 11.55 P. M., December 16, 1912. He was a life-long resident of New Brighton, where he was born January 17, 1845. After leaving public school in 1860, he entered the car works of Merrick, Hanna & Company until the summer of 1862, when he enlisted in Hampton's Independent Battery F, Pennsylvania Light Artillery. He was commissioned a lieutenant in the battery and served till July 26, 1865, when he was honorably discharged with his company. During 1866 he took a course in Smith's Business College, Pittsburg, after which he engaged in the foundry and plumbing business until 1896, when he retired from active work.

With the purchase of a small collection from Mr. Glasser he entered the study of entomology and devoted his leisure time to the collecting of Lepidoptera, in which pursuit he was assisted by his son, the late Harry D. Merrick. By industrious work during day time and the use of trap lights in a forest, a very interesting collection was accumulated and a number of species new to science were discovered. "Progress and Improvement" were our late friend's motto, and he showed this inclination even in the pursuit of his hobby by designing and inventing his trap lights, a collecting jar for high-resting moths and later a much improved apparatus for inflating larvae.

Mr. Merrick enjoyed an extensive correspondence and found much pleasure in filling several boxes from his duplicate stock and sending them to his friends. The death of his son proved a shock to him from which he never fully rallied, and Bright's disease undermined his health. For several years he spent the winter in Florida, but gained no permanent relief. Mr. Merrick was united in marriage with Laura Jane Duncan, of Fallston, Pa., who survives him.

Mr. Merrick disposed of his collection last year to Dr. Wm. Barnes.

HENRY ENGEL.

MR. L. E. RICKSECKER, well-known collector of California insects, died in San Diego in that State, January 30, 1913.

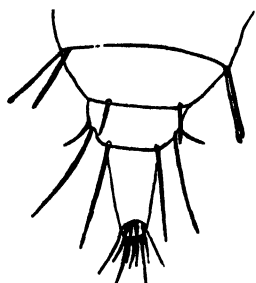


Fig 1

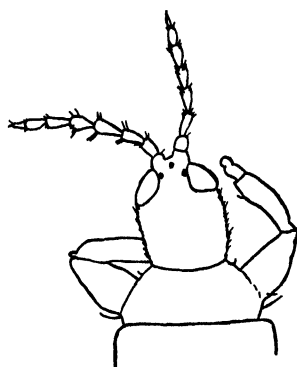


Fig 2

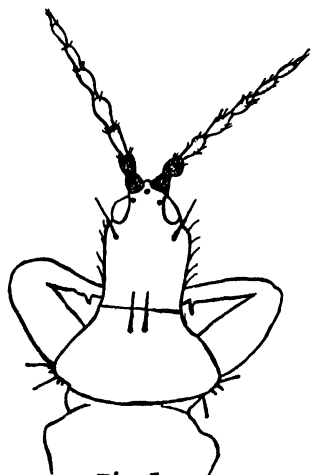


Fig. 5



Fig 3.

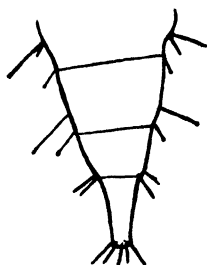


Fig 6



Fig 7.



Fig 4

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXIV.

APRIL, 1913.

No. 4.

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New Thysanoptera from Florida.

By J. R. WATSON, University of Florida Exper. Sta., Gainesville, Fla.

(Plate VI)

Cryptothrips floridensis, new species. (Plate VI, Figs. 1-4.)

Measurements: Head, length 0.25 mm., width 0.20 mm.; prothorax, length 0.17 mm., width 0.34 mm.; mesothorax, width 0.40 mm.; abdomen, width 0.44 mm.; total length of insect, exclusive of antennae, 1.89 mm.; tube, length 0.14 mm., width at base 0.075 mm.; antennae; 1, 36 μ ; 2, 51.7 μ ; 3, 77.6 μ ; 4, 78 μ ; 5, 65 μ ; 6, 63 μ ; 7, 54.5 μ ; 8, 40 μ ; total 0.42 mm.

General color, black, no purple pigment; tarsi dark brown and antennae yellow.

Head, cylindrical, one and one-fourth times as long as wide; sides almost straight and parallel.

Eyes somewhat triangular, 9x6 μ , reddish brown, not pilose, about 250 facets.

Ocelli present, concolorous with the eyes to which the posterior ones are closely applied.

Mouth-cone, rather bluntly rounding, reaching three-fourths of the way across the pronotum.

Antennae with eight segments, one and two-thirds times as long as the head; segments one and two black, concolorous with the head, segments three to six clear yellow, eighth and tip of seventh yellowish-brown.

Prothorax short, a little shorter than the width of the head, triangular, narrow in front, well-developed spines on posterior angles and two on the anterior part of each lateral margin.

Mesothorax wider than the prothorax and very short, sides almost straight.

Pterothorax a little narrower than the abdomen, sides almost straight.

Legs long, concolorous with the body except the brown tarsi.

Wings: Fore-wings reaching almost to the end of the abdomen, fringed with hairs which are nearly as long as the width of the abdomen, doubled for from 15 to 19 hairs, nerve weak and short, constriction rather slight.

Abdomen usually long and slender, usually widest at the second or third segment and tapering gradually to the seventh from which it rounds off more abruptly. A pair of bluntly-tipped hairs along the margin of each segment, becoming longer and arising from nearer the posterior angle on the posterior segments. The tube is 0.14 mm. long and about 0.075 mm. wide at the base. The end bears a circle of stiff hairs, eight of which are about two-thirds as long as the tube, six are shorter and weaker.

Males are similar but smaller.

Larvae: The very young are a uniform yellow in color; later they are straw-colored with numerous irregularly-shaped orange pigment masses, giving an orange color to the body, which is much wider in proportion to the length than is the case with the adult. The legs are dark brown. The antennae are at first purplish, turning to dark brown and later almost black. There are two dark areas on the head and two larger ones on the thorax.

Eggs 0.35 x 0.14 mm., black in color, surface reticulated in appearance, due to the fact that the wall is composed of hexagonal plates. They are placed in crevices in the bark of the host.

Described from fifty adults and numerous larvæ and eggs.

Found at Satsuma, Fla., in November and December by W. O. Richtman on camphor (*Cinnamon camphor*) seedlings. They were reported as quite numerous on the twigs and doing considerable damage.

Type in the collection of the Florida Agricultural Experiment Station. Cotypes sent to the U. S. National Museum.

Close to *C. californicus* Daniel, from which it differs chiefly in general color, color of the legs, color and length of the segments in part of the antennae and in its habitat.

Phloeothrips floridensis, new species. (Plate VI, Figs. 5, 6 and 7.)

Female. Total length 2.5 mm. Head 0.26 mm. long and 0.2 mm. wide; prothorax 0.2 mm. long and 0.38 mm. wide; mesothorax 0.18 mm. long by 0.395 mm. wide; metathorax 0.23 mm. long and same width as the mesothorax; abdomen about the width of the thorax; tube 0.16 mm. long and 0.05 mm. wide at its base; antennae, total length 0.46 mm., segments, 1, $30.2 \times 41.5 \mu$; 2, $52.8 \times 30.2 \mu$; 3, $71.7 \times 37.7 \mu$; 4, $83 \times 36 \mu$; 5, $75.5 \times 28 \mu$; 6, $64 \times 23 \mu$; 7, $56.6 \times 21 \mu$; 8, $26.4 \times 13 \mu$.

General color, dark brown under the lens, black to the naked eye.

Head, rounded in front, sides slightly converging posteriorly, the warts small and completely covering the surface, spines short.

Eyes, size 0.1×0.05 mm., oval in shape.

Ocelli large, placed well forward, posterior ones barely touching margins of the eyes.

Mouth-cone comparatively short, reaching only about two-thirds of the distance across the prothorax.

Antennae with eight segments, total length 0.46 mm. Basal two segments dark brown, concolorous with the head, third yellow but a little darker at the apex, fourth, fifth and sixth have the basal third yellow and the remainder light yellowish-brown, as are all of the seventh and eighth. Spines and sense-cones long and stout.

Prothorax 0.2 mm. long, 0.38 mm. wide, narrow in front, three long knobbed spines on each lateral margin.

Mesothorax and metathorax sides converging slightly posteriorly, each bearing a number of knobbed hairs.

Legs rather long, femora concolorous with the body, tibiae and tarsi yellowish brown, fore tarsi with a strong claw.

Wings. Fore wings rather short, barely reaching the sixth abdominal segment, fringed with hairs whose length is greater than the width of the abdomen. Hind wings a little shorter and with shorter hairs.

Abdomen long and narrow, first six segments of nearly equal width. Tube, sides converging only slightly posteriorly.

Male. Total length 1.36 mm. Head 0.24 mm. long and 0.19 mm. wide.

Antennae; joint 4, 70μ long; 5, 63μ ; 8, 30μ .

Front femora thicker and lighter in color than in the female and with a short, thick spine on the inner distal corner.

Abdomen markedly smaller and exceeded by the wings.

Otherwise like the female except that some other measurements are slightly less.

Larvae. Body mostly of an orange color. Anterior part of head, antennae, legs, and tube of a very light brown color. The antennae especially have a purplish tinge. Eyes small and red in reflected light. Tube relatively long and ending in two long hairs which are nearly twice its length.

Described from two males and one female. Taken from under loose bark on orange trees in the greenhouse of the Florida Experiment Station. They were found in connection with a fungus on which they were evidently feeding, January, 1913.

Types in the collection of the Florida Agricultural Experiment Sta.

***Leptothrips aspersus macro-ocellatus*, n. sub. sp.**

On orange leaves at Gainesville, Fla., in January, 1913, there were collected numerous specimens of a thrips, that for the most part, especially in its measurements, closely agrees with the description of *Leptothrips aspersus* Hinds, but differs in some respects and especially in the very large posterior ocelli and in having strong spines on the thorax. The ocelli measure nearly $23\ \mu$ in length, and nearly as wide.

There is considerable variation in the number of hairs on the doubled portion of the lateral fringe of the fore wings. The number in some fifty specimens examined varies from none at all to seventeen in one wing examined. From five to seven is the usual number, although quite a number had three. There is also considerable variation in the amount of constriction of the fore wings; in some, none could be detected.

I do not find any description of the young of this species. Mine are of a rich red color. The tube, preceding abdominal segment, and legs, are brownish red. The head, first joint of the antennae, and apical half of the second are yellow, the head having orange blotches. The remainder of the antennae is purplish black by reflected light, and brown by transmitted light, as are also the legs.

Everes comyntas and amyntula (Lepid.).

By G. T. BETHUNE-BAKER, Edgbaston, Birmingham, England.

(Continued from page 103.)

Everes amyntula. Boisd.

Everes amyntula Scudder, Syst. Rev. Peabody Ac. Sc., p. 56 (1872); Buff. Bull. iii, p. 114 (1876). Beth.-Bak., Can. Ent., p. 96 (1910). Dyar, List. Bull. U. S. N. M., p. 45 (1902). Chapman, Trans. Ent. Soc. Lond., p. 374 (1908). Tutt. Brit. Butt. iii, p. 74 (1909).

Lycæna amyntula Boisduval, Ann. Soc. Ent. France, II, p. 294 (1852). Morris, Syn. Lep. N. Am., p. 87 (1862). Strecker, Lep. Rhop. et Heter., pt. vii, p. 82 (1874); Butts, N. A. Syn. Cat., p. 92 (1878). Edwards, Cat. Diurn. Lep., p. 64 (1884). Morrison, Papilio, iii, 9. Wright, Papilio, iii, p. 119 (1883); Papilio, iv, p. 126 (1884). Holland, Butt. Book, p. 268 (1898). Skinner, Syn. Cat., p. 59 (1898). Coquillett, Journ. N. Y. Ent. Soc. VII, p. 211 (1899). Wright, Butt. W. Coast, p. 228, f. 385b, &c. (1905). Fletcher, Can. Ent., xxvii, p. 315 (1895). Wolley-Dod, Can. Ent. xxxiii, p. 167 (1901). Elrod, Butts. Montana, p. 139 (1906).

Var. *herri* Grinnell, Can. Ent. xxxiii, p. 192 (1901). Dyar, List, p. 45 (1902).

Plebeius amyntula Kirby, Syn. Cat. Diurn., p. 356 (1871).

Unlike *comyntas*, this species differs considerably in size from different localities. The largest forms I know of are the Campo (South California) race, where the males average 32 to 34 mm., whilst the females are rather smaller. I have a good series from San Diego, where they are as a race rather smaller. The Utah specimens (Spalding) are decidedly smaller. The smallest race appears to come from Aweme (Manitoba) sent me by Mr. Criddle; they average 24 mm., the only female being slightly larger; those from High River (Alta) are rather larger, from Calgary somewhat larger still, from Winnipeg again still slightly larger, the largest Canadian forms being from Quami-chan Lake, Vancouver, which are about the same size as those from Utah.

It is most interesting to find that this species is evidently in a period of active evolution and appears to be in process of setting up local forms. The Campo race is less bright in its blue color, whilst it has a uniform blue female with broad brown borders and with a marginal spotted row in the secondaries.

I have a large series especially of females. There is a tendency in the males also to develop the marginal spotted row, though it is much less prominent than in the other sex; this is also noticeable in Portola specimens. There is no special feature in the under side that is not applicable elsewhere. The San Diego males are decidedly deeper in tone of color. I have only three females from this locality, which are similar though perhaps brighter than the Campo form. The Utah race is certainly brighter in its blue than either of the Californians, whilst the females are also decidedly brighter, but the blue suffusion is smaller in area and the ground color is much blacker; on the under side also there is a difference, the spotting is less distinct, with perhaps rather more obsolescence. With one exception there is little difference in the upper side color in Canadian male specimens; the females are, however, dimorphic, viz., brown and suffused with blue. Those from Manitoba that I possess have a limited suffusion of bright blue, the ground color being almost black. I have four largish specimens from Fort W——, Winnipeg (I have been quite unable to obtain the name of Fort W——), which are blackish brown with a very slight and spare suffusion of dark blue scales only visible in a good light. Calgary specimens are similar, but the brown is less dark, whilst from Quamichan Lake, Vancouver, I have entirely brown females, also some with a very slight suffusion of dark blue scales. The under side of all these specimens differs slightly from those obtaining in the States; in all the spots are greatly reduced in size, and in a considerable number the spots in the secondaries are almost obsolete, in some quite obsolete. The obsolescence begins, as in *comyntas*, with the spot below the second costal spot, and with the fourth of the curved row, but it goes beyond this also, for on the other side of the Rockies and in Vancouver the prevalent form seems to be that with more or less spotless under side so far as the secondaries are concerned.

The one exception as to upper side color that I have already referred to calls for remark in more ways than one. Criddle's specimens from Aweme, Manitoba, are those in question; they are similar to the European *coretas* in color, that is, they

are slightly paler and perhaps clearer in tone of color than the usual form; they are also the smallest form I know, being, with a few exceptions, smaller than our *polisperchon*, the spots below are visible but quite minute in some, whilst in others the black has disappeared, leaving only the white behind; there is also a peculiar snowy hoariness over the whole under side. There is, of course, this tendency with all forms of this species, but it is specially prominent in this small form. Perhaps the most interesting point of all is the fact that I have two specimens that agree exactly in the color of the upper side with *decolorata* Stgr., this species being of a peculiar grayish blue—almost as much gray as blue—a form that obtains in Hungary and the Balkans and is distinct from *coretas* and *argiades*. Staudinger also records it from Ferghana (Eastern Turkestan) under the name *decolor*. He describes both as “viridi-coeruleus.” I have only been able to make one preparation of the genitalia of the latter, but this inclines me to believe that they are the same species. My late friend (Dr. Staudinger) thought that the wide divergency of habitat with no connecting link between must involve a specific difference. I think, however, that this is not the case and that *decolorata* should sink to *decolor* Stgr. These specimens again confirm my view that, as with *comyntas* so with *amyntula*, we have a development of *coretas*, not of *argiades*, *decolor* being a good species but nearer the former than the latter. The under side of these two special specimens is similar to the others from Aweme. The Calgary form has been said to be very specialized; I cannot, however, find where that is so. It is true I have but a dozen from that locality, but I cannot specialize these either from outward appearance or by the genitalia. I also have a dozen specimens from the High River, Alberta, which are quite similar to my Calgary ones.

All my correspondents unite in saying that this species is generally single-brooded, the reason probably being that the larvae feed on *Astragalus crotalariac*, so that, if they only eat the seeds, it is evident that there can be but one brood annually. This would also apply if during the early stages they

fed on the tender leaves or flowers but required the seeds in the later stadia. This is the method that obtains with *argiades* and certain others of the Lycaenidae, and it is quite possible to be the habit in more northern localities, where it is not an uncommon species. I am not forgetful of Mr. W. G. Wright's most interesting account of the larvae of this species (*Papilio*, IV, p. 126). The description of the newly-hatched larva, piercing immediately into the seed pod and then, after a short time, sealing up its entrance and making it water-tight, is of the greatest interest and no doubt applies generally to the Californian race. He speaks, however, definitely of a later brood hibernating probably as larvae. (This would agree with the habits of our European *argiades*.) Unfortunately I cannot make out whether there is a real second brood or not, as no dates at all are given. In Canada the general consensus of opinion is quite definite that there is but one brood, though of course it is possible in the more favored climatic conditions of California that there may be a second brood, or at least a partial one. Mr. Wright also definitely states that the larvae are not myrmecophilous and that they actually seemed to shrink from the touch of the ant's antennae. Here we have also a close similarity of habit to our *argiades* as, though Chapman notes a honey gland, I have been unable to trace any record of their association with those insects.

Turning now to the genitalia we find the highest development in the Californian specimens and this has taken place irrespective of size. I took several from San Diego and matched them in size with others from Utah, Calgary and Vancouver, all of which are figured. It will at once be seen that the Californian example has much the largest prehensores, and this obtains generally. Those from Utah are next in dimensions (though much smaller than the San Diego race), but they are run very close by those from Vancouver, whilst the Calgary specimens are well the smallest, and this with insects practically of the same size.

In the Californian specimens the clasps are very large, with very long hook-like extremities, the apices of which are shagreened very roughly and some way down from the apex itself. This shagreening

or spiculation is finer and less extensive in *argiades*, the hooks have no sharp curve and are fine, the lower soft spatulate extremity is longer and narrower than in the European insect, and is also very finely and closely spiculed with an abundant supply of very fine shortish hairs; the clasp itself is long and broad, being of a fairly even oblong shape; the fulcrum (or penis guide) is proportionately longer so as to reach up to the top edge of the clasp. The tegumen has the central projection hollowed so as to form a sharpish tooth and is shouldered (not well shown in figure), not sloping evenly off as does *argiades*, whilst the falces (the short spikes, generally hooks, just below the tegumen) are quite fine, in marked contrast to those of *argiades*. The aedoeagus is also of the *coretas* shape, viz., tapering from a broad base not nearly even in width, as in figure 1.

Comparing this with the Utah figure it will be noticed how still finer are the extremities of the clasps, going yet further away from *argiades*, but when it is compared with the Vancouver figure a difference will be seen. The hook-like extremities are shortened in the latter; they are of the same shape and curve as *amyntula* and our European *coretas*, but not so long; in this there is a slight approach to *argiades*. This also applies to the specimen figured from Calgary, but not to the same extent. The small specimens from Aweme, Manitoba, have appendages that are essentially of the *coretas* type in all particulars. We therefore have in North America an interesting position in the evolution of species. *Argiades* does not remain, but it has apparently left some trace behind in the Vancouver race with its shorter hook-like extremities in the clasps, though in no other particular; the Manitoba specimens are *coretas* so far as their genitalia are concerned, though they could at once be separated by their color and pattern. The Calgary examples, though with shorter hook-like extremities than is the case in the Utah and Californian insects, are certainly *coretas* and not *argiades*. This also applies to specimens from Victoria, B. C., whilst the Southern examples have developed their prehensores far away along the *coretas* line and quite apart from the European *argiades*. The position is full of interest and will need further investigation later on.

We now come to the relationship of *comyntas* to *amyntula*. It has been shown from the genitalia (of which I give three figures—one from Jamesburg, Middlesex, one from Michigan and one from New Mexico) that *comyntas* is distinct from *coretas*, though allied to it. The falces of the tegumen are quite different, in their fine hooked extremities, to the straight, small spike of *coretas* (this is well seen in the figure of the Jamesburg specimen), whilst of course the insect itself is very different in general appearance. The genitalia of the Michi-

gan insect agree with those from Jamesburg, but those from New Mexico, of which I have a very long series and which are certainly *comyntas*, approach in the length of the hooklike extremities of the clasps the Californian examples of *amyntula* and also in the straight spike-like falces of the tegumen. We thus have a somewhat similar evolution of the genitalia going on with *comyntas*, as I have shown to be the case with *amyntula*, both species being full of interest from this point of view.

From the facts of their life-history and their distribution, as also from the fact of their flying together in the Mount Shasta district, together with the differences in the genitalia, I cannot conclude otherwise than that the two species are distinct from each other and that, as already stated, they are nearest to *coretas* and not to *argiades*. *Amyntula* does not appear to have extended its range far to the East and in this respect differs from its more dominant ally, *comyntas*, which has spread itself right across the American continent into California. Manitoba and the western side of Lake Superior appear to be its eastern limit, at least I can trace no record further east. The localities other than those already named are: Stoney Mountain near Winnipeg (Wallis); High River, Alberta (Williams); Lake Kootenay, Sicamus, Penticton, Ashnoka, B. C. (all Mrs. Nicholl); Vancouver (Day); Victoria, B. C., California, widely distributed; Utah (common); Colorado, Western Montana, Arizona, Nevada.

It is not unlikely that some records may have escaped my notice, but it will be seen that *amyntula* has a much more limited range than *comyntas*, especially so east to west. Three local races of *amyntula* have been described, viz., *monica* from Southern California, *tijua* Reakirt, and also *herrii* Grinnell. Mr. Grinnell, with whom I have had the pleasure of a short correspondence, is evidently a very keen observer, but I think if he had had the advantage of having the type of *amyntula* before him that he would not have described the form. My friend, Mr. Oberthür, has kindly lent me his type of this species and I have it now before me, so that I can compare it accurately with the description of the variety. The differences

relied on by Mr. Grinnell are the width of the border, the extra heaviness of the under side pattern, the possession of only two red crescents instead of five, and the size together with the tails. Now in the type specimen the width of the border in the male is a full half millimeter, and the type itself possesses but two red crescents. In the specimens before me the heaviness of the under side pattern differs extraordinarily, as does also the number of red crescents, and as I have already said, I have females with quite narrow black borders to their wings. The only point that I can find is that the four specimens from which the description was taken (obtained at Cochise County, Arizona) were smaller than usual. Except for this I could match the description from several other localities. I have passed through the "lumping stage" long ago and am perhaps given to split finely at times, but I do not think I should have risked describing this on the slender and exceedingly variable differences relied on by the author. They are, I think, insufficient for an aberration.

Everes monica Reakirt and **tijua** Reakirt.

Everes monica. Dyar. List. Bull. U. S. N. M., p. 45 (1902). Tutt, Brit. Butt., iii, p. 75 (1909).

Lycaena monica Reakirt, Proc. Ac. Nat. Sc., Phil., p. 244 (1866). Strecker, Lep. Rhop. and Het., p. 82, pl. 10, f. 18 (1874); Cat. Macro. N. Am., p. 91 (1878). Edwards, Cat. Butt. N. Am., p. 65 (1884). Skinner, N. Am. Rhop., p. 59 (1898). Strecker, Lep. Rhop. Het. Suppl., p. 20 (1900). Wright, Butts. West Coast, p. 230 (1905).

Everes tijua Tutt., Brit. Butt. iii, p. 75 (1909).

Lycaena tijua Reakirt, Proc. Ac. N. Sc., Phil., p. 244 (1866). Wright, Butt. W. Coast, p. 230 (1905).

These are, I believe, generally accepted now as being synonyms and it appears to me that W. G. Wright is correct in separating them from this group—he places them between *arizonensis* and *isola*. The insect is described as having three transverse lines of spots between the cell and the termen in each of the wings, and they are stated to be rows of well-defined spots; this would separate it from *comyntas* or *amyntula*. It does not appear to have been taken again since it was described in 1866, though my friend, Mr. W. P. Comstock, tells

mè he has a specimen from San Diego, California, answering well to the description and figure. Mr. Wright states that he has not much faith in it. It is unsatisfactory to leave it thus, and if the type could be obtained for one of the big American museums a good service would be done thereby.

EXPLANATION OF PLATE V. (Published in the March Issue).

Male genitalia of species of *Everes*.

Fig. 1. *Everes argiades*, profile view.

Fig. 2. *E. coretas*, profile view.

Figs. 3-5. *E. comyntas*, profile view: 3, Michigan; 4, Fort Wingate, New Mexico, note the extreme size, also development of clasps; 5, Jamesburg, N. Jersey, semi-vertical view.

Figs. 6-10. *E. amyntula*, profile view: 6, Utah; 7, San Diego, California (note the large size of the genital organs); 8, Calgary, clasps profile, tegumen half turned around showing vertically; 9, Aweme, Manitoba, semi-vertical view; 10, Vancouver, profile view (note the somewhat stouter hooks to the clasp, being in this respect midway between *argiades* and *coretas*).

Fragments from an Entomological Diary, Texas, 1904.—Appearance of Insects in Spring.

By A. A. GIRAULT, Nelson (Cairns), North Queensland, Australia.

At Sherman, Texas, January 29, insects were dormant, excepting a few flies. At Houston, on the following day, though warm and springlike and farther south, the same conditions prevailed, a few flies only on the wing and active; a cluster of wasps found hibernating under the loose bark of a dead tree stump; they could walk but were unable to fly; they were *Polistes*. At Corpus Christi, February first and second, however, insects were active—a *Diabrotica* (12-*punctata*) was feeding upon truck crops, an acridid was flying about in a cabbage patch; moths and butterflies were seen; yet the general insect population was hibernating. On February 7, at Victoria, additional species of butterflies were observed in the afternoon; *Diabrotica* 12-*punctata* was active, but *Megilla maculata* was hibernating in colonies under the bark of trees. At Cor-

sicana, February 9, hibernation prevailed. So at Paris, February 12 but on February 15 a butterfly was observed on the wing; on the twenty-third, flies were active, also bees and a general movement from hibernation commenced; moths, obviously freshly emerged, were noted about the lights of the city at night. Butterflies were also flying. On the twenty-fifth, *Polistes* on the wing; also butterflies, jassids, acridids; *Megilla maculata* still hibernating; ants swarming; *Anasa* hibernating. Three days later, cicindelids were observed to be active and a *Chilocorus*; on March 1, cerambycids, chrysopids and cercopids were noted; by the following day, fruit trees were in bloom generally and insects now much more noticeable; psyllids were emerging from their galls, chalcids, libellulids, papilionids on the wing, insects numerous at lights at night.

On March 3, it was much colder and fires felt comfortable; insects very scarce and for several days afterward, the cold continuing. It was warmer again by the seventh and insects reappeared. *Malacosoma* hatching; *Lachnosterna* and *Passalus* recently emerged; *Diabrotica* noticed for first time here, also tipulids. The maximum temperature on the tenth was 71 deg. Fahr.; on the eleventh, maximum 76 deg., minimum, 46 deg. The twelfth was markedly warmer, the maximum reaching 89 deg., the minimum only 53 deg.; insects were noticeably more abundant than formerly, but on the thirteenth it cooled and again there was a marked decrease in the active insects seen. By saying it cooled, it should not be understood that the maximum temperature was much lower; it registered on the thirteenth 86 deg., the minimum 47; but the morning was much cooler and this had the effect of keeping insects inactive. The rest of the month the highest temperature ranged from 52 to 84 deg., the minimum from 30 to 69. By the seventeenth, the *Megilla* was active and the eggs of insects commenced to hatch. On March 26, it was again much cooler, and insects again noticeably much less active; on the 29th there were high southerly winds, which had the same effect as the cold but when it became markedly warmer the next day, though the wind continued, insect activity was heightened.

These general observations show how gradual is the commencement of activity in insects after hibernation, how each kind becomes active in its own time, and how even within a small amount of latitude there is a wide difference in times of appearance for each species. The effect of cold spells on insect activity is also shown. In Texas, the mean temperature is above 43 deg. Fahr. during the winter.

In Texas, in 1904, the following specific observations were noted; *Diabrotica 12-punctata* was active at Corpus Christi on February 1, at Paris not until March 7. *D. vittata* was not seen at Paris until March 17. Mosquitoes were first observed at Paris on March 12, but did not become noticeable until April 25; (according to Mr. G. H. Searles of Paris they were very numerous and annoying at Houston on March 20). *Lep-
tinotarsa 10-lineata* was not observed at Paris until March 23, its larvæ not until May. A hemipteron which I identified as *Blissus leucopterus*, the common chinch-bug of cereals, was noted several times—once hibernating (Feb. 27) in rubbish, edge of road near woods and under a stump standing in a cornfield (Paris), and a second time captured from grass at Paris on March 24; it was noted to be active the previous day. A species of *Gryllus* did not become adult until April 13, though insect activity had long since commenced. *Megilla maculata* De Geer was found hibernating at Paris on February 25; they could move. They were not observed to be active until March 17; the mean temperature on the former date could not have been much less than eight degrees lower than at the March date.

Malacosoma americana was first observed in the eggstage at Sherman, January 29. On March 7 at Paris, the fruit trees in general bloom, the larvæ of the first stage were present and hatching was general. On March 27 at Paris, larvæ 3 cm. long were noted in orchard trees and on March 31 the larvæ were preparing to pupate, since large ones measuring 4 cm. were found wandering about by themselves. But on April 3, many small nests were found along roads leading out from

Paris, and the larvæ in them were usually small, only a few nearly full-grown. On May 7 it was noted that the larvæ had long since disappeared, and on the 11th an adult was taken in a trap lantern at Paris.

Oiketicus abbotii was taken at Corpus Christi and what appeared to be the characteristic bags of *Thyridopteryx ephemeraeformis* were found at Corsicana. *Anasa tristis* was taken hibernating under rubbish near a cotton field at Corsicana, February 9; another at Paris in open woods, February 25, and two days later under the bark of fence posts around cotton fields; it was not noted as reproducing and active until in May (Paris). On February 28, *Chilocorus bivulnerus* was taken, active, at Paris. *Papilio* was first seen on the wing at Paris on March 2, but noctuids and *Colias* had been out several weeks; *Papilio turnus*, freshly emerged, was taken on March 10, a *Vanessa* on March 12, *Thecla* and *Thanaos* on the fifteenth; *turnus* again on March 24 and 27; *Anosia plexippus* mating on March 30, its eggs on April 2 and first stage larva on April 13. *Pontia rapae* eggs on April 18, very abundant on cabbages.

Calandra granaria was found at Paris, March 14, on ears of corn which had been exposed during the winter at Hetty; they were active. *Lachnosterna* first observed on March 7 at Paris when a single specimen was found on the sidewalk; on April 6, it was noticed that they were tolerably common at lights, on April 11 numerous, and abundant on April 18. *Calasama calidum* was taken on April 18, and *scrutator*, May 4, both at light.

Change in Title.

The "Pomona College Journal of Entomology," which has been published for the past four years, is to be continued under the title of *The Journal of Entomology and Zoology*.

The Journal will publish papers on morphological, systematic, and economic subjects, with general as well as technical articles. There will be short articles, reviews, and notes of general zoological interest. Although the publication will be adapted to the needs and conditions of Southern California, its subject matter will be of interest to all zoologists and entomologists. Subscription, \$1.00 a year; \$1.25 to foreign countries. Published quarterly.—WILLIAM A. HILTON, Acting Editor, Pomona College, Department of Zoology, Claremont, California, U. S. A.

New Peruvian Parasites from *Hemichionaspis minor* (Hym.).

By E. W. RUST, Assistant Government Entomologist, Lima, Peru.

For the past year the writer has been engaged in work directed against pests of the native or tree-cotton (*Gossypium peruvianum*) in the Department of Piura, northwestern Peru. During that time many enemies of the greatly feared plague known as "piojo blanco" (*Hemichionaspis minor* Mask.) both parasitic and predaceous, have been studied and of the former group by far the majority belong to Aphelininae and Signiphorinae. Several of these forms appear to be new to science and it is for the purpose of gaining for them a definite name and place in entomological literature that this short paper is written.

Some of the descriptions are from material reared by Prof. C. H. T. Townsend, Entomologist to the Peruvian Government, to whom the writer is deeply indebted, not only for the above-mentioned specimens, but equally so for his many helpful suggestions during the prosecution of this work. The remaining descriptions are from parasites reared by the writer, the type specimens of which are to be deposited in the U. S. National Museum.

Genus **PROSPALTELLA** Ashmead, 1904.

Prospalta (= *Prospaltella*), Howard; described in "Insect Life," 1894—2 species—no type designated.

Prospalta (= *Prospaltella*), Howard; mentioned in "U. S. Tech. Ser. No. 1," 1895—2 species—no type designated.

Prospalta (= *Prospaltella*), Ashmead; mentioned in "Chalcidoidea," Jan., 1904—type designated as *murtfeldtii*.

Prospaltella, Ashmead; proposed in "Proc. Ent. Soc. Wash." 1904.

Prospaltella, Howard; mentioned in "U. S. Tech. Ser. No. 12, part 4," 1907—type designated as *aurantii*.

On studying this genus it becomes evident that the generic description was drawn up from the species *murtfeldtii*, but Dr. L. O. Howard, in his "Revision of the Aphelininae of North America" (Technical Series No. 12, Part IV, U. S. Bureau of

Entomology, pg. 79, 1907) cites *P. aurantii* as the type. However, this cannot be accepted, for W. H. Ashmead in the "Classification of the Chalcid Flies" (Memoirs of the Carnegie Museum, Vol. I, No. 4, p. 345, 1904, designated *P. murtfeldtii* as the type of the genus. Previous to this, the writer finds no mention of a type species, as the original description of the genus by Dr. Howard (Insect Life, Vol. VII, p. 6, 1894) is silent on the subject, as is also a subsequent paper (Technical Series No. 1, U. S. Bureau of Entomology, p. 39, 1895). Therefore Ashmead's designation of *murtfeldtii* as the type must hold. That such is the case is rather unfortunate, as this species is rather less typical of the genus, as now known, than is *P. aurantii*. Moreover, with the addition of the species herein proposed, a few long-needed changes in the generic description become more apparent than ever.

1. First joint of the club is *not* always the widest. In *P. peruviana* sp. nov. the second joint equals, or is greater than, the first in width.

2. In some species the body does *not* taper "gradually from tegulae to tip of abdomen." This gradual tapering may be true of the type species, *P. murtfeldtii*, but it is not the case with *P. peruviana* or specimens of *P. aurantii* collected in Peru, in which the sides of the first, or longest, segment are nearly parallel, and in *P. berlesci* How. the abdomen is actually wider in the center than at either extremity.

3. Eyes *not* always naked. The eyes of *P. peruviana* are distinctly hairy, as can be seen in fresh specimens with the 16 mm. objective, or in balsam mounts with the 4 mm. objective. The eyes of *P. quercicola* How. are also mentioned as being faintly hairy, in the description of that species (Annals Entomological Society of America, Vol. I, p. 282, 1908).

***Prospaltella peruviana* sp. nov.**

Female.—Length, 0.75 mm.; greatest length of fore wing, 0.6 mm. Differs from *P. aurantii* How. to which it is closely related, as follows: Body slightly larger. Funicle joints 1, 2 and 3 increasing gradually and uniformly in both length and diameter. Fore-wings broader, slightly longer, not so slender and with a more pronounced outward

bend distad of stigmal vein, thus making distal half of wing broader in proportion to length than in *P. aurantii*. General color darker, being dark brownish yellow on thorax with brown abdomen; scutellum in life, pale-greenish with a suggestion of yellowish which in mounts becomes decidedly yellowish; legs honey-yellow. Fore-wings with dilute fuscous area covering disc below fuscous marginal vein.

Male.—Unknown.

Described from 2 female specimens reared by Prof. C. H. T. Townsend from *Hemichionaspis minor* Mask. on cotton, Mal-lares, May 25, 1910, and Macacará, Aug. 5, 1910. (both Dept. of Piura). Balsam mounts.

Type specimen on slide labeled Macacará, Aug. 5, '10.

This species has since been collected in great numbers both at Lima and all through the Department of Piura. In life its strikingly noticeable green scutellum distinguishes it at a glance from other species, although it seems to be somewhat intermediate between *P. aurantii* and *P. berlesei*; resembling the former in general wing and body characters and the latter in antennal structure, except for the short first funicle joint which alone would distinguish it from closely allied species.

Genus **SIGNIPHORA** Ashmead, 1880.

With regard to numbers, this genus is very well represented in Peru, the individuals being plentiful in various coccids, especially in *Pseudaonidia* sp. and *Hemichionaspis minor*. To date, however, only two species have been recognized, one of which is new and is described below; the other differing from the original description to such an extent, in some cases, that the following points have been noted at various times:

Signiphora occidentalis How.

Specimens of this species collected in various parts of Peru vary greatly in coloration. Some agree exactly with the original description of the species (Insect Life Vol. IV, No. 3 [1894] p. 235) while others show more yellow than the species is credited with. In the original description the head is spoken of as dark brown, but the writer has before him specimens of both sexes otherwise typical, in which the head and antennae

are almost wholly yellow, being touched with light brown only upon the vertex. Other female specimens show the pronotum with only a spot of brown near its center, the rest being lemon-yellow, and with the whole metanotum of the latter color. Some male specimens differ from the original description in having the scutellum bright lemon-yellow, all gradations between the two having been met with in Peruvian material.

The above observations were made from both balsam and dry mounts, and tend to show that the original description fixed the coloration of this species a little too closely (probably owing to the small number of specimens on which the description was based) and that the ratio of yellow to brown really varies quite widely among the different individuals of the species.

***Signiphora lutea* sp. nov.**

Female.—Length, 0.65 mm.; greatest length of wing, 0.5 mm. exclusive of cilia. Antennal scape robust, reaching to middle of eyes; pedicel large, stout, two-thirds as long as scape, and about the same width; funicle joints 1, 2 and 3 very small, increasing slightly in diameter from 1 to 3, joint 3 being from two to three times length of joint 1 and joint 2 intermediate in length between joints 1 and 3; together they are rather less than one-third length of pedicel, and the largest is only one-half the diameter of pedicel at its thickest part; club a trifle more than twice length of pedicel, long-oval in side view and nearly twice as wide as pedicel, when seen from above it is of same width as funicle joint 3, with parallel sides. Club sparsely longitudinally striated. Marginal vein with 6 strong, prominent bristles, sub-marginal vein with one and stigmal vein with one. All wing veins fuscous; forewings with fuscous patch covering all the disc below marginal and stigmal veins. Hind wings as in *S. occidentalis*.

Middle tibiae with two external spines near base and one near tip. Head deep lemon-yellow often tinged with brown on vertex; antennae lemon-yellow at base shading through fuscous into brown at tip of club; eyes very dark-red, almost black; ocelli dark-red; mouth parts light-brown, mandibles black-tipped. Thorax lemon to canary yellow except for brown pronotum and front margin of mesonotum, three minute black dots on each side near insertion of wings. Abdomen generally slightly darker than thorax, with a varying band of brown on cephalic portion. This brown band may vary in size from wide, covering the first three abdominal segments, to linear, or even dis-

appear. Small black spot on each ovipositor-sheath near its insertion. tip of same, brown. Legs yellow.

Male.—Aside from sexual characters, resembles female except in being rather smaller, more slender and having a brown patch on each side of the median line of the penultimate abdominal segment.

Described from many male and female specimens reared during 1910-1912 in the Dept. of Piura, Peru, and at Lima, Peru, from *H. minor* and *Pseudaonidia* sp. on various hosts, principally cotton and citrus. Both dry and balsam mounts.

Type on slide labeled A, 163° 3a. Samán (Dept. Piura) 12-22-'11—Rust.

NEOSIGNIPHORA gen. nov.

Differing from *Signiphora* in that body is larger and more slender. Antennae 7-jointed, counting scape as one joint, although it is really composed of two joints, the first of which may not articulate with head but which shows a distinct suture. Scape long and moderately slender, first joint nearly one-half as long as second and a little more slender; pedicel large and robust; funicle 4-jointed and quite small; club very long and slender, undivided and with several longitudinal keels. Mandibles tridentate. Eyes naked. Sub-marginal vein of fore-wing nearly twice as long as marginal. Apical spur of middle tibiae scarcely two-thirds as long as first tarsal joint.

Type, *N. nigra*, sp. nov.

Neosigniphora nigra sp. nov.

Female.—Length, 0.8 mm.; greatest length of wing, 0.55 mm. exclusive of cilia. Antennal scape moderately slender, reaching almost to top of eyes, pedicel a little longer than first scape joint and much more robust, being of a diameter equal to half its length; funicle joints 1, 2, 3 and 4 increasing gradually in diameter, the first being very small and the fourth of nearly two-thirds the diameter of club; funicle joints 1, 2 and 3 subequal in length, joint 4 from two to three times as long as any of the other three; club very long and slender tapering to a point, as long as scape, pedicel and funicle joints together and (when seen in broad outline) two-and-one-half times as wide as scape, or a little wider than pedicel; slightly crescent-shaped. Marginal vein with 5 strong bristles, sub-marginal with two, stigmal with one. Middle femora with strong spine near tip on inner side. Middle tibiae with two spines on outside at base and one near tip.

Color: Head (except vertex) dark brown, vertex deep brownish-yellow, eyes black, ocelli dark-red; mesonotum and metanotum brownish-yellow; rest of thorax and abdomen dark brown; legs mostly whitish except for a brown cloud over the upper half of the tibiae and the lower part of the femora; wing veins fuscous; fore-wings with just a suggestion of an indefinite fuscous band in center of wing parallel to the marginal and sub-marginal veins.

Male.—Unknown.

Described from ten female specimens reared by Prof. C. H. T. Townsend from *H. minor* on cotton from Chaquira, Dept. of Piura, Peru, Aug. 9 and 10, 1910. Five slides, balsam mounts.

Type specimen, one of three on slide labeled: Chaquira Aug. 10-'10—T.

Prof. Townsend notes the following from live specimens: "Fresh specimens show the head inflated and with whole of wide front light yellow; a little of face is yellow, but broad cheeks are blackish; prothoracic scutum with silvery anterior margin, pale yellow posteriorly-directed inwardly-oblique lateral border, and two light yellow fasciae immediately behind same and separated from each other by a black hair-line, the hinder one much the wider. Rest of thorax and all of abdomen shining black."

In this genus we have what appears to be a two-jointed scape. The first joint may or may not be movable, but it is at least separated from the head by a distinct suture. The writer has noted this peculiarity in other genera, particularly in *Signiphora*, and Prof. Townsend notes it in some undescribed species from the montaña of Peru. As yet no literature has been found upon this subject which is one which should be investigated by those interested in this and allied groups of the superfamily.

Monograph of Aleocharinae. (Coleop.).

We learn through the *Pomona Journal of Entomology* that Dr. A. Fenyès, of Pasadena, Cal., is monographing the Aleocharinae (Staphylinidae) for the *Genera Insectorum*.

A New *Signiphora* from Queensland, Australia (Hym.).

By A. A. GIRAULT, Nelson (Cairns), North Queensland,
Australia.

The following new species was captured too late to be included in my monograph of the subfamily Signiphorinae, now in course of publication in the Proceedings of the United States National Museum. I also record another species new to the fauna of the continent. The new species is the twenty-eighth of the genus.

Genus **SIGNIPHORA** Ashmead.

1. *Signiphora reticulata* new species.

Normal position.

Female.—Length 0.80 mm. Moderate in size for the genus.

Black, the head and thorax dark metallic green, the wings perfectly hyaline, with no proximal fumation. Venation, legs and antennae brownish black. Proximal three tarsal joints and much of the cephalic tibia, yellow. Mesonotum and vertex, finely, transversely lined. Abdomen, the rectangular (wider than long) scutellum, the transverse mesopostscutellum and the triangular propodeum all similarly, distinctly polygonally reticulated. Discal bristle absent. Stigmal vein conical. Marginal fringes of the fore wing very short, those of the posterior wings slightly longer, the latter wings very broad, where widest full three-fourths the width of the fore wings. Antennal club conic-ovate and moderate in length.

Male.—Not known.

Described from a single female specimen mounted in balsam and captured with the sweeping net in a forest near Ayr, Q., November 6, 1912. (From 2-3-inch objective, 1-inch optic, Bausch and Lomb.).

Habitat: Australia—Ayr, Queensland.

Type: No. Hy. 1281, Queensland Museum, Brisbane, the foregoing specimen in xylol-balsam.

Belongs to the *nigra* group and to that section of it where the marginal fringes of the fore wing are very short. Closely allied with the Australian species *corvina* Girault (description still in MS. in the monograph mentioned) from which it differs in bearing hyaline wings, narrower fore wings and in being much

less robust. The species *funeralis* has decidedly longer marginal fringes and its wings are deeply fumated throughout.

2. *Signiphora aspidioti* Ashmead.

I have captured two specimens of this species, heretofore known from Mexico only, at Nelson (Cairns), North Queensland, Australia; a female from a window, August 3, 1912, and another specimen of the same sex in the same place, October 9, 1912. The capture was made in a township area.

3. *Signiphora australiensis* Ashmead.

A female specimen of this species was taken from a window at Proserpine, Queensland, November 2, 1912. The propodeum is delicately polygonally reticulated.

Observations on Buprestidae at Southern Pines, North Carolina (Coleop.).

By ABRAM HERBERT MANEE, Southern Pines, N. C.

Chalcophora virginiensis Drury.

In October an occasional specimen on young pines probably feeding. December to March, under pine straw at foot of large pines mostly on north side of trees. April and May, mates and oviposits on fallen or standing freshly dead pines. Quite abundant.

Chalcophora georgiana Lec.

October and November, many fresh specimens *feeding* on needles of young pines. Must hibernate, but I cannot find their haunts. From late March to June, very abundant on young pines, where they mate and feed among the needles. Probably oviposits in dead spots of living pines. More abundant than *virginiensis*.

Dicerca pugionata Germ.

Five specimens taken viii-7-'12 on black alder.

Dicerca obscura Fab.

Late March through April, abundant on trunk and limbs of persimmon; later occasionally on leaves of persimmon saplings. In autumn old dull forms on persimmon and rarely hibernates under loose bark. Fresh spring specimens have a whitish

bloom easily lost in poison jar or capsule, but which may be preserved by very dry killing and immediate mounting. Nearly all specimens are wide and dull blackish, but a rare winter form is narrow and coppery.

Dicerca spreta Gory = *americana* Hbst.

Late winter under loose bark of large deciduous trees. Rare.

Dicerca punctulata Sch.

In early November, very rarely among needles of young pines; in December, under pine straw or at base of living loblolly pines or in shaggy bark of living long leaf pines. The new sub-species *pinorum*, Casey, occurs with *punctulata* and is distinguished by connected thoracic striae, wider elytra, and coarser ventral punctures. Both forms are dull reddish brown with whitish bloom.

Buprestis rufipes Oliv.

One specimen vi-30-'05 flew to person at edge of wood. One specimen sent from ten miles west. Two right wings.

Buprestis lineata Fab.

June to late July on blasted pines, occasionally on pine logs.

Buprestis fasciata Fab.

Very rare, in lowlands July to late August.

Buprestis striata Fab.

October 27 and November 22, split out fresh imagines from pitch pine cordwood, at the latter date also some pupae and larvae; from late March to early April, among needles of young long-leaf pines, probably feeding; mid-April to early May, rather active and often above reach on denuded trunks of blasted pines where they mate and oviposit.

Buprestis decora Fab.

Larva and imagines split out of rotted pine railway ties in late October; in December, from warmth of woodbox may leave its fuel home; from mid-March to early May, among needles of young long-leaf pines, probably feeding; in May, on denuded trunks of dead and semi-decadent pines; an occasional stray specimen in June.

Note. *Striata* and *decora* remain in the wood as imagines from late October to spring, *decora* emerging about March

1st, *striata* in early April. *Striata* seeks pine in its second year of death, *decora* prefers pine more nearly rotted, *lineata* desires pine in first death year, *apricans* oviposits exclusively in cracks of dry dead spots or blazes of large living long leaf pines.

***Buprestis apricans* Hbst.**

Late March to early April, among needles of young long-leaf pines, probably feeding; mid-April to mid-May, on dead blaze of big living long-leaf pines. This is the favored locality of this large and very choice borer.

***Melanophila notata* Lap. and Gory.**

Only one specimen in six years, then on June 27, 1911, took 38 at blazing pine stump as they flew to our clothes or rested in white ashes or on nearby wood. Of these, 20 were gold-spotted, 16 were immaculate and 2 were very small, immaculate and, as I at once saw, a distinct species. F. Blanchard thought this near *opaca* and probably new. H. C. Fall thinks it near *longipes* and perhaps new. June to August, 1912, took more *notata* at burning pine and learned that natives call them "fire bugs," believing them to actually come from the fire and to contain such heat as to burn the skin should they rest upon it. It is probably drawn by the scent of burning pitch. As it alights on a black stump one would think its generic name fitting to that habit as well as to its own color, yet it as readily seeks white ashes or a white shirt. Both forms of *notata* vary in size from 7 mm. to 13 mm., but every specimen is either entirely unmarked or distinctly marked, though the marks may vary from two to full number.

***Melanophila* sp.?**

Two specimens vi-27-'11 as mentioned above. Length 7 mm. Slightly wider and more rotund than *notata* of same length. Sculpture of thoracic and elytral bases less pronounced than in *notata*. Greatest width of thorax at first third, while in *notata* it is medial or post medial.

***Melanophila carolina* Blanchard MS., n. sp.**

Four specimens taken among needles of young long leaf pines, two in June, 1910, one vii-18-'11, one vii-19-'11. See below.

***Anthaxia cyanella* Gory.**

Two specimens, May.

***Anthaxia quercata* Fab.**

May; not uncommon on small oaks.

***Anthaxia flavimana* Gory.**

May and June; not common on young pines.

***Chrysobothris floricola* Gory.**

April, May, September, October; not uncommon in foliage of young long-leaf pines but very shy and active.

***Chrysobothris dentipes* Germ.**

Late April to mid-July, common and active on fresh pine logs.

***Chrysobothris pusilla* Lap. & Gory.**

May, June, not common in foliage of young long-leaf pines.

***Chrysobothris chrysoela* Ill.**

Early April, on twigs of persimmon. Very rare.

***Chrysobothris harrisii* Hentz.**

Early June, on black alder. Very rare.

***Acmaeodera ornata* Fab.**

Late March or early April on dog-wood blossoms. Very rare.

***Acmaeodera pulchella* Hbst.**

June, July, on blossoms of primrose and other yellow flowers. Not common.

***Acmaeodera culta* Web.**

Late March and April, on dog-wood blossoms, later on blackberry. Very common.

***Eupristocerus cogitans* Web.**

Late May, on black alder. Rare.

***Agrilus ruficollis* Fab.**

Late May to late July, on blackberry. Not common.

***Agrilus bilineatus* Web.**

Two specimens, April.

***Agrilus vittaticollis* Rand.**

One specimen.

Agrilus granulatus Say.

One specimen on black alder.

Agrilus politus Say.

June, July, abundant on willow.

Agrilus egenus Gory.

Mid-April to mid-May, on foliage of dog-wood.

Taphrocerus gracilis Say.

Mid-May, not common on low oak bush.

Brachys ovata Web.

March to late summer, on leaves of oak. Exceedingly abundant. Lives in leaves of oak, splitting the leaf as it feeds, pupates in leaf in February and becomes imago in leaf in early March.

Brachys aerea Melsh.

May, June, on oak. Rare.

Pachyscelus laevigatus Say.

June, not uncommon on a low thin-leaved milky weed.

DESCRIPTION OF NEW SPECIES.

Melanophila carolina Blanchard MS., n. sp.

As the late Mr. Blanchard left this manuscript name unpublished, I will attempt a description which must not interfere with Blanchard's authorship.

Length 6.3 mm., width 2.5 mm.; sub-cylindrical; face crinkly-punctate; thorax densely but not coarsely punctulate, unsculptured, very rotund at sides to near basic third where from beneath it slopes in an incurved edge to point of broad basic spur, or spear-point; upper aspect, sides rounding to basic third whence it is parallel to near point of spur; elytra densely and coarsely punctulate, broadly and deeply indented at shoulder, plump and smoothly rounding to below mid-costae, sides nearly parallel to middle whence after a slight widening they slope to the rounded tips; color, bright metallic, beneath cupreous running to dark green on ventral segments, above, head and thorax reddish cupreous, elytra olive, one specimen steel blue; male claspers with four or five fine hairs curving inwardly and backwardly.

Southern Pines, North Carolina. Four specimens as above stated; one in the Blanchard collection, one with Col. Wirt Robinson, one is owned by Dr. E. C. Van Dyke, the fourth is in the cabinet of the author.

Some Sources of Laboratory Material for Work on the Relation of Insects to Disease:*

By WILLIAM A. RILEY, Cornell University, Ithaca, New York.

The great discoveries during the past twelve or fifteen years regarding the relation of insects to disease have made it imperative that departments of entomology be prepared to give at least elementary instruction along this line. When one undertakes to outline some such work the question of securing material immediately arises.

There is comparatively little difficulty in obtaining various parasitic mites and ticks, lice and bugs, house-flies, mosquitoes, and fleas, in their different stages, and it is important that such should be available for laboratory study. Very much zest and value can be added to the work if there be available also some of the parasitic protozoa and worms which are transferred by arthropods, but there is usually the feeling that these, with the exception of the human malarial parasite, are tropical forms and beyond reach. When one investigates conditions, however, he finds that even in our Northern States there is a surprising variety of forms which may be utilized to great advantage. It is for the purpose of calling attention to some of these and getting the experience of others that I have chosen this topic.

We do not have the fly-borne germ of the nagana or of the dread sleeping sickness, but we do have the first discovered trypanosome of warm-blooded animals—the *Trypanosoma lewisi* of the brown rat. This parasite is transferred by the rat flea and louse. For practical purposes it is more valuable for laboratory study than any other of the genus, and certainly shows all the detail that would be desired. It is practically cosmopolitan in distribution and has been found in this country at least in Detroit, Lincoln, Philadelphia, Ann Arbor, Madison, San Francisco, Urbana, Baltimore and Ithaca. It may be transferred from rat to rat—white or brown—by the crudest of injections and thus kept for laboratory study. If one has

*Contribution from the Entomological Laboratory, Cornell University.

the necessary equipment for bacteriological work and the skill he may keep artificial cultures by the method first perfected by MacNeal and Novy, '03.

It should not be forgotten that the first trypanosome described and the type of the genus was found by Gruby, in 1843, in the blood of the frog. This, or a very closely related species, is not rare in frogs in this country, and on account of its comparatively enormous size is a striking object for demonstration. Other species are to be met with in the blood of fishes and reptiles.

Closely related to the Trypanosomes are certain flagellated parasites of the alimentary canal of insects. The most common of these are *Crithidia melophagia*, which is found in practically all sheep ticks, and *Herpetomonas muscae domesticae* which is very common in the house-fly. It is claimed by some that the first of these is a stage in the development of a blood parasite of the sheep. Whether that is true or not both forms are of interest as parasitic protozoa of insects.

The complicated life-cycle of the malarial parasite is not readily comprehended by a student who has had no training in protozoology and hence I find it very helpful to introduce this subject by the study of a comparatively simple sporozoon, and by the examination of some of the larger haemosporidia.

The most satisfactory and readily available form for introductory work is a species of *Monocystis* from the seminal vesicles of the earthworm. Practically every worm is infested, though the larger ones are more easily examined by beginning students. I have never failed to find during a practicum the immature trophozoites within the sperm morulae, motile trophozoites, encysted gametocytes, cysts, spores and mature sporozoites.

Of the Haemogregarinidae, one of the first discovered was *Lankesterella ranarum* (better known as *Drepanidium ranarum*), which was found by Lankester in 1872. This is fairly common in frogs at Ithaca and in those which I have had from North Carolina and from Wisconsin. While the life cycle of this species is not understood, Durham, '02, believes that the

sexual stage of a related South American species is passed in a tick. Quite similar to *Lankesterella* of frogs are species of the genus *Haemogregarina* which may be readily found in turtles and snakes.

Coming closer to the malarial parasites, the bird parasites, which have been so important in elucidating the life cycle of the human malaria are available. I have found about 50 per cent. of the crows taken around Ithaca, in the summer, infested with *Halteridium*. It is much rarer in the English sparrows.

Proteosoma is to be found in the English sparrows at Ithaca though in no such astounding percentages as Berkeley reports for New York where, he states, he "found *Proteosoma* infection in 75 per cent. or more of all sparrows examined" in September. I have not found them in more than 6 per cent. of those examined, and apparently Opie was no more successful at Baltimore.

Of course, occasionally opportunities for the study of human malaria may arise and these will be more frequent as physicians understand that one is prepared and willing to make such examinations.

Of the higher parasites which are insect borne the most important are the filariae. About three out of four of the crows about Ithaca harbor at all times of the year a blood filaria which is a striking object for study. Another species I have found once in an English sparrow at Ithaca. Though these blood filaria of the crow are five times as long as the blood corpuscles, they may be present in enormous numbers. Mr. Coutaunt and I have estimated that 500 occurred in a single drop of blood in one specimen examined. The record is held by a crow which I used in a practicum last year. The parasites were so abundant that I had independent estimates made by each of twelve careful students. The figures averaged nearly 2,000 for a single mount. No figure was lower than 2,000.

The double-pored tapeworm, *Dipylidium caninum*, of dogs and cats passes its intermediate stage in the flea and the louse, as many as fifty cysticercoids being found in a single flea.

Though the adult worm is common at Ithaca I have not located the immature stage as yet.

These are but a few illustrations of forms that are available and which may be studied without complicated apparatus or special training beyond that gained in the course of the work. As an aid in beginning such study, demonstration specimens of a few of the blood parasites may be purchased. Some of these are to be obtained from the Western Biological Supply Co., Station A, Lincoln, Nebr., and a larger assortment is handled by W. Watson & Sons, 313 High Holborn, W. C., London. Helpful as such specimens may be, no one who has once examined the living parasites or his own preparations, will be satisfied to depend on the meager opportunities for purchasing material of this nature.

Cystodiplosis eugeniae n. sp. (Dipt.).

By E. P. FELT, Albany, N. Y.

The midges provisionally referred to this genus were reared in April, 1912, from hairy leaf galls on *Eugenia burifolia*, collected by Dr. E. A. Schwarz at Key West. The transformations are completed within the gall, since several protruding exuviae were observed. The galls occur in irregular clusters of 10 to 15 or more upon the upper surface of the leaves.

Gall. Irregularly spherical or somewhat elongate, monothalamous, with a diameter of about 1.5 mm. The walls of the gall are moderately thick, quite high and exteriorly thickly clothed with long, crinkly, yellowish or reddish brown hairs.

Exuviae. Length 2.5 mm., whitish transparent. Antennal cases short; thoracic horns rudimentary; leg cases extending to the 7th and 8th abdominal segments, the wing cases to the third. Dorsum of the abdomen thickly and uniformly clothed with stout, chitinous points.

Male. Length 1.5 mm. Palpi composed of one minute oval segment. Mesonotum and scutellum dark brown. Abdomen mostly light reddish brown and sparsely clothed with yellowish setae. Genitalia slightly darker. Wing narrow, length 2.4 mm., width .9 mm.; the subcosta unites with costa at the basal third, the third vein at the apex, the fifth is well developed basally and obsolescent, including the branches, apically. Legs yellowish brown, the femora slender and slightly longer than the more slender tibiae; claws very long, slender, simple, the pulvilli about one-half the length of the claws. Genitalia: basal clasp segment greatly swollen, much resembling that of *Asphondylia*; terminal

clasp segment subapical, short, obese, apically with a heavy, chitinous spur and internally with a group of thick, long setae; dorsal plate divided, the lobes roundly triangular; ventral plate short, tapering broadly to a broad, slightly emarginate setose apex. Harpes rather long, slender, somewhat spoon-shaped, well chitinized.

Female. Length 1.5 mm. Antennae (presumably female), third and fourth segments free, the fifth with a stem about one-fifth the length of the cylindric basal enlargement, which latter has a length two-and-one-fourth times its diameter, a rudimentary basal whorl of setae and low apparently anastomosing circumfili, these latter suggesting somewhat the condition seen in the male antennae of *Asphondylia*. Ovipositor short, fleshy, with a length less than one-fourth that of the abdomen, the terminal segment being stout and terminating in rather broad, triangular lobes. Other characters, so far as observed, practically as in the male.

Type Cecid a2378.

The specimens from which the above description was drafted are badly broken and our only excuse for the characterization is that the biological data may be preserved. The species is so peculiar that there should be no difficulty in identifying the midge from the data we have given. It is possible that this species represents a new genus in the Asphondyliariae, something which can be determined best after perfect specimens of both sexes are available.

A New Species of *Dixa* from Chile (Dixidae, Dipt.).

By CHARLES P. ALEXANDER, Ithaca, N. Y.*

In a collection of Neotropical crane-flies belonging to the Hungarian National Museum and kindly sent to me for determination by Dr. Kertész, there was included a species of *Dixa* from Chile. This is the first record for a member of this family of flies from south of the Equator. Of the 21 described species, 12 are European, 8 are American and 1 is Chinese. Of the American species all are Nearctic with the exception of the widely distributed *Dixa clavulus* Williston† which was described from the Island of St. Vincent. Dr. Johannsen has examined this specimen and states that it is very different from

*Contribution from the Entomological Laboratory of Cornell University.

†Trans. Ent. Soc. Lond., 1896. Part 3, p. 298, fig. 73.

any of the American species, the types of which he has studied in Cambridge.

Dixa chilensis sp. n.

Male. Length about 3.5 mm.; wing 3.8 mm. Mouth parts and palpi dark brownish black; clypeus and front yellowish, suffused with brown on the sides; antennae dark brown, the third segment much paler, more yellowish; vertex and occiput pale yellowish-white.

Pronotum light chestnut brown; mesonotum, praescutum very pale, almost white with three dorsal stripes; the intermediate stripe is broader and begins just behind the cephalic margin of the sclerite; the lateral stripes are narrower, begin at about mid-length of the sclerite, continuing caudad and including the sides of the scutum; middle line of the scutum and the scutellum dull yellowish; post-notum dark brown. Pleurae with a broad silvery white band, delimited by two narrow dark brown stripes, the upper one beginning on the cervical sclerites and running to the base of the halteres; the lower stripe running above the bases of the coxae. Halteres pale, apices of the knobs dark brown. Legs, fore and middle coxae yellow, brownish in front, trochanters pale, whitish-yellow; femora and tibiae very light brown, narrowly tipped with dark brown; tarsi brown; hind legs, femora much brighter colored, yellowish, broadly tipped with brownish black; tibiae dark on basal half, passing into a broad, dull yellowish post-median band; tip of tibia swollen, black; tarsi brown. Wings, subhyaline, cells *C* and *Sc* more yellowish; an irregular brown mark at the origin of *Rs*, a second at the arcuation of *R* 2+3, a third at the top of *R* 1 extending down over the fork of *R* 2+3; cross veins and many of the longitudinal veins narrowly and indistinctly seamed with a lighter brown; anal cell a little brown



on the angle; venation (see figure), cross vein *r-m* far before fork of *Rs*; *R* 2+3 at origin perpendicular, extremely arcuated, fork of *R* 2+3 much shorter than the fused portion.

Abdomen brown.

Holotype, ♂, Concepcion, Chile; Aug. 23, 1904 (P. Herbst).

Type in the Ungarisches National Museum.

The species differs from all of the known American forms in the extreme arcuation of *R* 2+3 and the shortness of the fork of this vein.

ENTOMOLOGICAL NEWS.

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TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., APRIL, 1913.

According to *Science* for January 17 last, there were presented to the scientific societies, meeting at Cleveland, Ohio, in Convocation week, 1912-13, 822 papers. The highest number accredited to any one science was 84 to Zoology, Entomology being second with 73.

The February number of the *News*, in the department of Entomological Literature, listed the titles of 103 papers pertaining to the entomology of the Americas (North and South) including Arachnida and Myriopoda, as well as contributions to anatomy, physiology and embryology of insects whether American or exotic, received at the Academy of Natural Sciences of Philadelphia in the space of one month. This list professedly excludes much of the economic literature.

The newly-established *Review of Applied Entomology*, Volume I, Series A, part 1 (reference to which is made on another page of this number of the *News*) says:

It is not perhaps generally realized how numerous or how varied are the existing publications which are liable to contain entomological information. A preliminary survey of the subject has resulted in the compilation of a list (by no means complete) of no less than 1,700 periodicals—scientific, agricultural and medical,—which may contain articles dealing with entomology . . . Furthermore, the number of periodicals expressly dealing with Economic Entomology is steadily growing from year to year; and this is due not only to a more

general recognition of the high importance of this subject both in its agricultural and medical aspects, but also to the greater activity in the development of tropical areas, where the depredations of insects are most severely felt. It may be said with some degree of certainty, that there is at present no single institution in the world at which all these multifarious journals may be consulted.

Much current literature in Entomology, as in other subjects, is not original or important, but the quantity which is entitled to these two adjectives is so great that the necessity of listing or abstracting it for the use of investigators becomes more pressing every year. The *Review* just quoted is the latest attempt to do this in certain entomological fields. All the existing bibliographical agencies appear to be necessary, for experience has shown that no one of them succeeds in attaining completeness. Whether this failure is partly due to the fact that some authors and publication agencies send their work to one bibliographer, some to other recorders, seems to be a matter well worthy of consideration by those in charge of such praiseworthy and useful drudgery.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

The British Imperial Bureau of Entomology.

In the summer of 1911, when the prime ministers of the self-governing dominions were present in England, they were invited by the Secretary of State for the Colonies to discuss with the Entomological Research Committee (appointed by the Colonial office in 1909) certain proposals for furthering and co-ordinating the investigation of injurious insects throughout the Empire. At this meeting it was unanimously agreed that the establishment of a central organization for this purpose was desirable, and consequently a tentative scheme was submitted for the consideration of the Colonial Governments concerned.

At a further conference, held at the Colonial office in August, 1912, the matter took more definite shape, and it was proposed to form an Imperial Bureau of Entomology, to be supported by contributions from the various Dominions and Colonies, as well as from the British Government. The principal functions of this bureau will be to collect and co-ordinate all information bearing upon injurious or useful insects; to organize a system for securing the authoritative identifica-

tion, with reasonable promptitude, of all insects of economic importance submitted by officials connected with Departments of Agriculture or Public Health throughout the empire; to compile gradually a comprehensive card-index to the whole literature of the subject; and to publish monthly the present journal, which is intended to give an up-to-date epitome of the current literature.

The bureau is fortunate in having secured as its president so eminent an administrator as the Earl of Cromer, and the names of the many distinguished gentlemen who have been good enough to act on the Honorary Committee of Management will be sufficient guarantee that its work will be carried out in an efficient and sympathetic manner.

[The three preceding paragraphs have been taken from the Preface, page 1, Series A, Vol. I, of the journal referred to in the second of those paragraphs, *The Review of Applied Entomology, Issued by the Imperial Bureau of Entomology*. It is issued in two series: A. Agricultural, B. Medical and Veterinary. Vol. I, Ser. A, Part 1 consists of 32 pages, Vol. I. Ser. B, Part 1 of 20 pages; both are dated January, 1913. The subscription to both series is 12 shillings per annum or, separately, A 8 sh., B 5 sh., orders and subscriptions to be sent to Messrs. Dulau & Co., Ltd., 37 Soho Square, London, W. The Honorary Committee of Management is composed of the same persons as constitute the Entomological Research Committee (Tropical Africa). The general secretary of the bureau is likewise Mr. A. C. C. Parkinson; the Director and Editor, Mr. Guy A. K. Marshall; Assistant Editor, Mr. W. North. The head office is at the British Museum of Natural History, the publication office at 27 Elvaston Place, London, S. W.]

An Entomologist Wanted for Arcadia.

We want an adult entomologist, preferably a married man, to come to Arcadia, lease a building site, erect a small cottage and live near to nature in the spirit of the Institution. He shall have the freedom of the Institution without expense, but for his services no salary will be paid. We are looking for some one who has retired from the active duties of life, and expects to spend the rest of his days in close proximity to the entomological world.

Arcadia is well equipped with every facility for studying nature and especially so in entomology. Within the adjacent territory, especially in Nymphalia, which is a part of Arcadia, there are facilities for studying various kinds of aquatic and marsh insects. The laboratory is well equipped with apparatus for classifying, examining, photographing, etc. There are breeding cages for studying the insects in their transformations, and whatever further equipment may be necessary will be made to suit the needs of a student.

Full particulars as to what the Agassiz Association is and what is its Arcadia, what it has done and what it is trying to do, and including a copy of "The Guide to Nature," will be sent upon application.

On the other hand, full particulars will be required of the personality, skill, experience, plans, etc., of the applicant who would come here and take charge of our Entomological Department. We would prefer some one who has retired from active business life and has means to devote the rest of his days to his favorite pursuits, but such entire devotion of time is not necessary. Arrangements could be made for some income for services, if desired. Employment of various kinds can be obtained in the vicinity, but, as previously stated, the ideal would be one who has retired and intends to devote all the rest of his time to the interests and beauties of entomological nature.

For further particulars apply to The Agassiz Association, Edward F. Bigelow, President, Arcadia, Sound Beach, Connecticut.

Entomological Meeting in California, 1915.

The Entomological Society of America has received an invitation from the Panama-Pacific International Exposition to hold a meeting in some Californian locality in the summer of 1915. This gathering may be at either of the universities or on the exposition grounds. It has received the enthusiastic support of western entomologists. These latter have attended many eastern meetings and this is an excellent chance for us to return the compliment. It may be possible for a number to go out with a party, stopping off at one or more interesting points en route. As chairman of a special committee to consider this matter and report at the next meeting of the Association, the undersigned would welcome suggestions in regard to this meeting and also expressions relative to the support it would probably receive from eastern entomologists.—E. P. FELT, State Museum, Albany, New York.

[Attention may be called to the fact that the time of this proposed meeting coincides with that of the Third International Congress of Entomology, to be held at Vienna.—ED.]

Some Nomenclatural Questions.

To the EDITOR, ENTOMOLOGICAL NEWS.

Sir:

A case anent the whole discussion of nomenclatorial priority.

The Coleopterous family Trogositidae was separated by Rev. W. Kirby (1826) from the Nitidulidae, where the group was lumped by Erichson. Family based on type *Trogosita* (Olivier) *mauritanica* (Linné). In 1865 (circa) it was discovered that Pallas had previously erected the genus *Tenebrioides* to fit this species. Therefore the

name *Trogosita* falls as a synonym. Secondly—Pallas by a printer's error was made to say "*Tenebroides*." Thirdly—J. O. Westwood (1840?) separated *virescens* as a new genus—under name *Temnochila*. Under the law, what is the name of this family? The priority name is Trogositidae, based on a type name now non-existent. European writers have adopted *Temnochilidae*. On family names the law of 1832 is silent. Meanwhile, the genus *Ostoma* Laich (1783) was based on *Peltis* (Illiger circa, 1805) *ferruginea* Linné.

Should the misprint "*Tenebroides*," an obvious error, stand? Should the family be "Trogositidae," "*Temnochilidae*" or "*Ostomidae*"? Does the law of 1832 refer to families?

Linné suffered from a printer's error, "*Dyticidae*" (Greek *dyticus* = a diver). All subsequent authors are printing *Dytiscus*, an obvious error, until corrected by Encyclopedia Britannica, 11th edition (v, article Coleoptera).

The coleopterous genus, *Cnemidotus*, Illiger, 1802, was based on a *Haliphus*. Erichson redescribed the genus, using the same name, based on *caesus*, Duft., 1832. The type of the genus still stands. The law of priority, specifying that a synonym may not again be used, was adopted subsequently to Erichson's description. Ex post facto legislation is hardly acceptable. It is proper, then, that Regimbart in 1878, should put *Cnemidotus* back into synonymy in favor of his own parallel creation, *Peltodytes*?

Does not your census show that strictly taxonomic students are in favor of strict priority by about 3 to 1? The majority on the other side was made by amateurs, 10 to 1, and economic students 4 to 1.

Again, is not real opinion 5 to 1 in favor of strict priority, at least, in case of species?

I think it is generally conceded that no definition of "genus" has been written which is acceptable widely anywhere. Certainly, when Hübner wrote on Lepidoptera, he had no idea of a genus which coincides with any other opinion. Moreover, has anyone (in Coleoptera, at least) acceptably defined a family, except Leconte?

The nomenclature problem is the most important matter to come before a world's congress.

Sincerely,

R. P. Dow.

Recollections of A. R. Grote, by John G. Milburn.

[I have in my library the first two volumes of the Proceedings of the Buffalo Society of Natural Sciences bound, and on the title page the inscription, "E. C. Sprague, Esq., with Compliments of Augustus R. Grote and John George Milburn." In each volume is the book-plate of E. C. Sprague. Last September, in looking over a number of the

American Historical Review, I saw the notice of a paper read at a meeting of the Buffalo Historical Society by John G. Milburn; of course I recognized the name, and immediately wrote to Mr. Milburn at Buffalo, from which place my letter was forwarded to his present home in New York City. I have just received a reply which is of such interest to one interested in the lives of naturalists, that I here give some of it to the readers of the News.—F. GRINNELL, JR., Pasadena, Cal., December 24, 1912.]

"I am sorry that I cannot tell you much about Grote. He was the director of the museum on a small salary and in the front rank of entomologists. He was, I should say, in the middle of the '70's, somewhat over thirty years of age, dark, slight in build, and of a nervous, mercurial temperament. He was a man of general culture, quite a poet, and devoted to music. I have a dim recollection that he had some connection as an organist with church work; but I may be all wrong about that. He was a delightful companion and a good talker. Those were the days when Darwinism was spreading fast, and of what used to be called the conflict between science and religion. Grote was rather the leader of the group of young men to which I have referred, and for them every problem of the universe was in the melting pot.

When Grote was not occupied in identifying or describing some new species, he was writing a lyric, composing an opera, or recasting theology. He was a very vivid and interesting personality.

.(Signed) JOHN G. MILBURN.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues, which are generally dated the year previous.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

2—Transactions, American Entomological Society, Philadelphia.
4—The Canadian Entomologist. 5—Psyche. 7—U. S. Department of Agriculture, Bureau of Entomology. 8—The Entomologist's Monthly Magazine, London. 10—Nature, London. 11—Annals and

Magazine of Natural History, London. 12—Comptes Rendus, L'Academie des Sciences, Paris. 13—Comptes Rendus, Societe de Biologie, Paris. 18—Ottawa Naturalist. 22—Zoologischer Anzeiger, Leipzig. 30—Memoires, Societe Zoologique de France, Paris. 40—Societas Entomologica, Zurich. 73—Archives, Zoologie Experimentale et Generale, Paris. 79—La Nature, Paris. 89—Zoologische Jahrbucher, Jena. 97—Zeitschrift fur wissenschaftliche Zoologie, Leipzig. 106—Internationale Entomologische Zeitschrift, Guben. 184—Journal of Experimental Zoology, Philadelphia. 191—Natur, Munchen. 193—Entomologische Blatter, Cassel. 198—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. 200—Bulletin Scientifique de la France et de Belgique, Paris. 204—New York State Museum, Albany. 216—Entomologische Zeitschrift, Frankfurt a. M. 223—Broteria. Revista de Ciencias Naturales do Collegio de S. Fiel (Ser. Zoologica). 246—Bulletin International, Academie des Sciences de Cracovie, Ser. B. Sciences Naturelles. 269—Memoirs, Department of Agriculture in India. Entomological Series, Calcutta. 274—Archiv fur Zellforschung, herausgegeben von Dr. R. Goldschmidt, Leipzig. 278—Annales, Societe Zoologique Suisse et du Museum d'Histoire de Geneve, Revue Suisse de Zoologie. 284—Bulletin, Museum National d'Histoire Naturelle, Reunion Mensuelle des Naturalistes du Museum, Paris. 332—Bulletin of the Southern California Academy of Sciences, Los Angeles. 335—Smithsonian Miscellaneous Collection. 385—Festschrift zum Sechzigsten Geburtstag Richard Hertwigs. 394—Parasitology, Cambridge, England. 407—Journal of Genetics, Cambridge, England. 419—Transactions of the Canadian Institute, Toronto. 420—Insecutor Inscitiae Menstruus: a monthly journal of entomology, Washington, D. C.

GENERAL SUBJECT. Cockerell, T. D. A.—Nomenclature at the Zoological Congress, 10, 1913, 648-49. Cosens, A.—A contribution to the morphology and biology of insect galls, 419, ix, 297-387. Forbes, S. A.—Report (27) of the state entomologist of Illinois. Galloway, T. W.—Zoology. Phila: P. Blakiston's Sons & Co., 1912, 481 pp. Hartert, E.—Gegen die zulassung von ausnahmen vom prioritatsgesetz, 166, vi, 317-318; 193, 1913, 24-26. Macnamara, C.—The milkweed and insects, 18, 1913, 151. Meissner, O.—Praktische zuchtkasten, 40, xxviii, 13-14. Nabert, A.—Die corpora allata der insekten, 97, civ, 181-358. Rosenau, M. J.—Some experimental observations upon monkeys concerning the transmission of poliomyelitis through the agency of "Stomoxys calcitrans," 5, 1912, 191-194. Schroder, C.—Handbuch der entomologie, Erste Lief., Jena, 1912. Steudel, A.—Absorption und secretion im darm

von insekten, **89**, xxxiii, 165-224. **Toyama, K.**—Maternal inheritance and mendelism (silk worm), **407**, ii, 315-405. **Wright, W. G.**—Obituary, **332**, xii, 19-21.

ARACHNIDA, ETC. **Bonnevie, K.**—Ueber die struktur und genese der Ascarischromosomen, **274**, ix, 433-57. **Fabre, J. H.**—The life of the spider (Translation), New York, 1913, 404 pp. **Goldschmidt, R.**—Das nervensystem von "Ascaris lumbricoides und megalocephala," **385**, ii, 255-354. **Hadwen, S.**—The life-history of "Dermacentor variabilis," **394**, v, 234-237. **Hirschler, J.**—Ueber die plasmastrukturen in den geschlechtszellen der Ascariden, **274**, ix, 351-398. **Phisalix, M.**—Effets physiologiques du venin de la mygale de Haiti (Phormictopus carcerides) et de Corse (Cteniza sauvagei), **284**, 1912, 132-138. **Schtschelkanowzew, J. P.**—Der bau der mannlichen geschlechtsorgane von Chelifer und Chernes, **385**, ii, 1-38, 1910. **Sokolow, I.**—Untersuchungen ueber die spermatogenese bei den Arachniden, **274**, ix, 399-432.

Clark, A. H.—Notes on American sp. of Peripatus, with a list of known forms, **335**, ix, No. 17, 5 pp. **Clarke & Ruedemann.**—The Eurypterida of New York, **204**, Mem. 14, vol. 1-2, 628 pp. **Muralewic, W. S.**—Einige bemerkungen ueber aussereuropaische Scolopendriden, **22**, xli, 196-202. **Ribaut, H.**—Ascospormorphora (Myriophodes), **73**, x, 399-478.

APTERA AND NEUROPTERA. **Boring, A. M.**—The odd chromosome in "Cerastipsocus venosus," **198**, xxiv, 125-132. **Bugnion, E.**—L'imago du "Coptotermes flavus." Larves portant des rudimentes d'ailes prothoraciques, **30**, xxiv, 96-106. **Waterson, J.**—A suggestion for securing certain Liotheids (Mallophaga), **8**, 1913, 36.

Aulmann, G.—Psyllidarum catalogus, 92 pp. (W. Junk, Berlin, 1913). **Navas, L.**—Neuropteros nuevos de America (conclusion), **223**, xi, 45-53.

ORTHOPTERA. **Meunier, F.**—L'asymetrie frequente des elytres de Blattidae du terrain houiller de Commeny et la phylogenie des groupes, **12**, 1913, 493-96. **Ramme, W.**—(See under Coleoptera.)

Carl, J.—Phasmides nouveaux ou peu connus du Museum de Geneve, **278**, xxi, No. 1, 56 pp.

HEMIPTERA. **Boring, A. M.**—The chromosomes of the Cercopidae, **198**, xxiv, 133-146. **Brocher, F.**—Recherches sur la respiration des insectes aquatiques adultes. La Notonectes (2d article), **89**, xxxiii, 225-234. **Butler, E. A.**—A contribution towards the life

history of "*Berytus clavipes*," **8**, 1913, 28-32. **Foot & Strobell**.—Preliminary notes on the results of crossing two hemipterous species with reference to the inheritance of an exclusively male character . . . **198**, xxiv, 187-204. **Johannes, Dr.**—Biologisches ueber die bekanntesten wasserwanzen, **191**, 1913, 221-222. **Rigaku-hakushi, C. S.**—Life history of "*Schlechtendalia Chinensis*" (a gall-producing insect), **385**, ii, 241-252.

Lindinger, L.—Die schildlaus (Coccidae), Europas, Nordafrikas und Vorderasiens . . . , Stuttgart, 1912, 388 pp. **Sasscer, E. R.**—An index to catalogues of recently described Coccidae, **7**, Tech. Ser. 16, pt. 7. **de la Torre Bueno, J. R.**—Some heteropterous hemiptera from Southern Pines, N. C., **4**, 1913, 57-60.

LEPIDOPTERA. **Bartsch, R. C. B.**—"Sugaring" in the autumn, **5**, 1912, 195-199. **Fuchs, F.**—Zur biologie von *Heterogynis pennella*, **216**, xxiv, 179-180, 182. **Gillmer, M.**—Zum ueberwinterungszustand der schmetterlinge, **166**, vi, 301-302. **Guyenot, E.**—Les papilles de la trompe des lepidopteres, **200**, xlvii, 288-346. **Kopec, S.**—Regenerationsversuche an fuhlern, augen . . . der schmetterlingsraupen und imagines, **246**, 1912, 1096-1102. **Linstow, Prof.**—Die sinne und sinnesorgane der raupen, **166**, vi, 299-301. **Marsh, H. O.**—The horse-radish webworm (*Plutella armoracia*), **7**, Bul. 109, pt. 7. **Martini, W.**—Beitrage zur kenntnis der Elachista-raupen, **216**, xxvi, 174-75. **Menzel, H.**—Einfluss der ausseren umgebung auf die farbung der schmetterlingspuppen (*Vanessa urticae*), **89**, xxxiii, 235-258. **Reiff, W.**—Ueber den schmetterlingsfang am licht, **166**, vi, 310-11. **Schwangart, Dr.**—Ueber die traubenwickler (*Conchylis ambiguella* und *Polychrosis botrana*) und ihre bekampfung . . . , **385**, ii, 465-534.

Dyar, H. G.—Notes on cotton moths, **420**, i, 1-12.

DIPTERA. **Esterly, C. O.**—The "oil fly" of So. California (*Psilopa petrolei*), **332**, xii, 9-11. **Green, E. E.**—On the humming of Chironomidae, **8**, 1913, 37. **Guyenot, E.**—Etudes biologiques sur une mouche "*Drosophila ampelophila*," **13**, 178-182, 223-225. **Lutz, F. E.**—Experiments concerning the sexual difference in the wing length of "*Drosophila ampelophila*," **184**, xiv, 267-274. **Richardson, C. H., Jr.**—Notes on the life-history of "*Corethra albipes*," **5**, 1912, 200-203.

Alexander, C. P.—New Nearctic Tipulidae, **5**, 1912, 163-171. **Johnson, C. W.**—The No. American species of the genus *Hæmalopota*, **5**, 1912, 181-183. **Malloch & Knab.**—"Limosina mirabilis," a sp. of Borboridae new to the U. S., **5**, 1912, 199. **Townsend, C. H. T.**—Inquiry into the relationship and taxonomy of muscoid flies, **4**, 1913, 37-57.

COLEOPTERA. **Champion, G. C.**—Note on the larva of *Scirtes*, **8**, 1913, 32-33. **Frost, C. A.**—Note on "*Tricrania sanguinipennis*," **5**, 1912, 208. **Holdhaus, K.**—Ueber die wissenschaftliche und praktische bedeutung des zu schaffenden "Ganglbauerpreises," **103**, 1913, 8-12. **Hunter & Pierce.**—The movement of the cotton boll weevil in 1912, **1**, Circ. 167. **Ramme, W.**—Die bedeutung des proventriculus bei Coleopteren und Orthopteren, **89**, xxxv, 419-456. **Urban, C.**—Beitrage zur lebensgeschichte der kafer, **103**, 1913, 16-19 (cont.).

HYMENOPTERA. **Acloque, A.**—Les fourmis a miel des deserts mexicains, **79**, 1913, 161-163. **Davidson, A.**—*Masaria vespoides*, **332**, xii, 17-18. **Dutt, G. R.**—Life histories of Indian H., **269**, iv, 183-267. **Sladen, F. W. L.**—The humble-bee, its life-history and how to domesticate it; with descriptions of all the British species of *Bombus* and *Psithyrus*, London, 1912, 283 pp. **Turner, C. H.**—An orphan colony of "*Polistes pallipes*," **5**, 1912, 184-190.

Cockerell, T. D. A.—(Change genus *Hoplitella* to *Hoplitina*), **4**, 1913, 34. Descriptions and records of bees.—Xl.IX, **11**, xi, 185-195 (cont.). **Franklin, H. J.**—The Bombidae of the New World (Pt. 1), **2**, xxxviii, 177-486. **Wheeler, W. M.**—Additions to our knowledge of the ants of the genus *Myrmecocystus*, **5**, 1912, 172-181. The male of "*Eciton vagans*," **5**, 1912, 206-207.

A CONTRIBUTION TO THE MORPHOLOGY AND BIOLOGY OF INSECT GALLS.
By A. Cosens, M.A. Reprinted from the Transactions of the Canadian Institute, Vol. IX, pp. 297-387, 1912. University Press, Toronto; 13 plates.

This paper, both botanical and entomological in its character, describes investigations carried on in the Botanical Laboratories of the University of Toronto under the supervision of Prof. J. H. Faull. Only its entomological results are dealt with here. The anatomical and histological structure of galls produced by 8 species of *Acarina*. 8 *Aphididae*, 1 *Psyllid*, 1 *Sesiid*, 1 *Tortricid*, 2 *Gelechiids*, 1 *Tineid*, 12 *Cecidomyiidae*, 10 *Nematinae*, and 24 *Cynipidae* are described; the order in which they are treated—*Acarina*, *Hemiptera*, *Lepidoptera*, *Diptera*, *Hymenoptera*—corresponds in a general way with an increasing complexity in the galls.

In dealing with the *Lepidopterous* galls attention is called to "the highly specialized habits of the larva, developed in caring for the welfare of the imago..... Thus in each of the forms studied provision is made by the larva for the emergence of the moth from the gall. These habits are seen at different stages of development. In *Stagmatophora ceanothiella* Cosens, and *Eucosma scudderiana* Clem-

ens, the gall wall is simply gnawn partly through, while in *Gnorimoschema* an aperture of exit is carefully prepared and plugged. These different methods of procedure are remarkably suited to the habits of the insects. In the former a plugged exit would not be suitable, as the insect winters in the larval condition and the drying of the gall would prevent the plug from slipping out easily. In the latter the galls are still green when the insect becomes mature and the plug mechanism is preferable. It is clear then, that in these galls the producer is much more active in providing for its own welfare than in the higher types and the plant renders a relatively smaller amount of assistance As I have repeatedly found the opening through which the larva of *Eucosma scudderiana* has entered the stem [of *Solidago*], it is certain that this Lepidopterous producer always oviposits on the outside of the host, and this may prove to be true of the entire group."

Adler found that cell proliferation on the part of the plant to form saw-fly galls preceded the hatching of the saw-fly's egg and hence concluded that these galls, in contradistinction to those produced by other insects, owe their origin to the wound caused by oviposition. Mr. Cosens obtained galls of three species of *Pontania*, of this family, with the larvae still within the egg and here also considerable proliferation of plant tissue had already occurred. He suggests the "slight possibility that secretions or excretions from the developing larva may be active through the egg membrane" as the gall-forming stimulus.

The walls of Cynipid galls are usually differentiated into an inner nutritive, and an outer "protective," zone. Adler held the latter to be a defence against parasites, but Mr. Cosens found seventy-five per cent. of the galls of *Amphibolips confluens* parasitized in spite of its thick epidermis and well-developed protective sheath. "Apparently the only protective function that can be ascribed to this tissue is the prevention of injury to the producer by desiccation during its later larval and pupal stages of development."

Gall-producing larvae differ in their habits of feeding on the gall tissue. In the Acarina (Eriophyidae), Hemiptera (Aphididae, Psyllidae), Diptera (Cecidomyidae, Trypetidae) and Cynipidae (but not inquiline), the cell contents alone furnish the nourishment and these are withdrawn from the cells without destroying the cell-walls. On the other hand, Lepidopterous, Coleopterous, and Tenthredinid gall-producing larvae, and at least some inquiline Cynipid larvae, devour both the cell-walls and the cell-contents. Mr. Cosens made experiments showing that the larvae of the Cynipid *Amphibolips confluens* secretes a salivary gland enzyme which changes starch to sugar; he holds that this ferment "must act through the cell membrane lining

the interior of the larval chamber." From serial cross-sections he finds that the alimentary canal of *Philonix nigra* and *Amphibolips confluentis*, both gall-producers, is complete throughout and possesses an anus, quite the reverse of previous ideas on this detail of Cynipid anatomy. No fragments of plant cell-walls were found in the intestinal lumen of these two species, although such were found in the similarly sectioned lumen of an inquiline. He also obtained evidence that inquilines have a limited ability to stimulate gall-production.

On the question of the response of the plant to the stimulus effected by the insect leading to the production of a characteristic gall, Mr. Cosens rejects the conventional view that the protoplasm of the plant has been endowed with entirely new characteristics and shows that the apparently new tissues of the gall can be found in other normal parts of the host or of its relatives.

Another interesting relation between plant and insect is summarized thus: "The larva secretes an enzyme capable of changing starch to sugar which acts on the starchy constituents of the nutritive zone [of the gall] and accelerates the rate of their change to sugar. The material thus prepared supplies nourishment for both the larva and the gall."

There is a bibliography of 46 titles. The thirteen plates contain 85 figures reproduced by the Heliotype Co., of Boston, from photographs of sections of galls.

Doings of Societies.

AMERICAN ENTOMOLOGICAL SOCIETY.

Meeting of December 9th, 1912, Dr. Philip P. Calvert, President, in the chair. Nine persons present. The reports of the Treasurer, Curator, Librarian and Publication Committee were read. The annual election was held and the following persons were elected to serve as officers for the year 1913: President, Philip P. Calvert; Vice-President, H. W. Wenzel; Treasurer, E. T. Cresson; Curator, Henry Skinner; Librarian, E. T. Cresson, Jr.; Recording Secretary, Henry Skinner; Corresponding Secretary, J. A. G. Rehn; Publication Committee, E. T. Cresson, C. F. Seiss, B. H. Smith; Executive Committee, P. Laurent, H. W. Wenzel, D. M. Castle; Finance Committee, C. S. Welles, D. M. Castle, Morgan Hebard.

Meeting of February 27th, 1913, Dr. Philip P. Calvert, President, in the chair.

Dr. Skinner made some remarks on the *Hesperid* genus

Thanaos and referred to the value of the genitalia as characters for specific separation.

Mr. Rehn exhibited the type specimens of three species of Argentine Orthoptera which also represent three previously unknown genera. The first, a walking stick, belongs to a group of genera peculiar to Paraguay and the adjacent portion of northern Argentina. The second, a member of the Acridid sub-family *Ommexechinae*, is a most interesting annectant type as it connects in numerous characters two heretofore rather widely separated sections of the sub-family. The third genus is a very remarkable katydid type more nearly related to the genus *Insara* than to anything else. The latter genus reaches its greatest development in Central America and it seems doubtful that several species recorded from South America and assigned to the genus really belong there. The collection of which the new genera form part was made by Mr. P. Jorgensen and the study of the same developed the fact that fifty-six of the total of one hundred and sixty-two species had not previously been recorded from Argentina. The major portion of the series was from the northeastern territory of the Misiones, which is the most tropical portion of the country, the majority of the species found there being Brazilian types.

Mr. Hornig said he had collected cocoons of *Callosamia angulifera* suspended by silk from the twigs of the tulip tree and exhibited a suspended cocoon which he thought was *angulifera*.

Dr. Calvert referred to studies of the honey bee made by Dr. D. B. Casteel, in which he had corrected erroneous ideas as to the physiology of parts of the legs of these insects.

HENRY SKINNER, *Secretary*.

NEWARK ENTOMOLOGICAL SOCIETY.

Meeting of January 14, 1912, in Newark Turnhall, Newark, New Jersey. President Buchholz in the chair and fourteen members present.

Mr. Brehme showed 38 different forms of *Apantesis* and Mr. Buchholz 34 forms.

Meeting of February 11, 1912, in Turnhall. President Buchholz in the chair and twenty-one members present.

Resolved unanimously to move headquarters from Turnhall to Newark Free Public Library.

Resolved unanimously, on motion by Dr. McCormick, to draw up a resolution to thank the Newark Turnverein for having given hospitality to our society for some years.

Mr. Keller showed male and female of *Catocala herodias*, also the type of *Catocala albida*.

Mr. George Franck gave a very interesting talk on collecting Lepidoptera in the Catskills (Mountain Crest House, on the Tannersville Railroad), and showed specimens which he caught there, also a very interesting box of different Catocalas.

Meeting of March 10, 1912, in the Free Public Library. President Buchholz in the chair, sixteen members present.

Mr. Bischoff inquired about the making up of a public collection of insects, which led to the question of uniform labels. To take up this matter, a committee was appointed, consisting of Mr. Bischoff, Mr. Rommel and Mr. Keller.

A committee on field meetings was appointed as follows: Messrs. Stortz, Herman Brehme and Rommel.

Special meeting held at Mr. Herman H. Brehme's residence March 13, 1912, on account of the death of Dr. John B. Smith, one of the members of our society. Mr. Buchholz presided. Fourteen members present.

A letter was received with invitation to attend the funeral of Dr. Smith. This invitation was accepted.

Resolved to have suitable resolutions drafted and engrossed, and have them inserted in the "Sunday Call" and in the "Ezrahler" of the New Jersey Freie Zeitung. Also to have a floral piece placed on his coffin.

Meeting of September 8, 1912, in the Free Public Library, Mr. Buchholz presiding and twelve members present.

Mr. Doll reported the capture of hibernating Noctuidae: *Jodia rufago* and *Copipanolis cubilis*, both in early spring.

Mr. Buchholz caught *Catocala phalanga* in Elizabeth, September 8.

Mr. Lemmer found caterpillars of *Catocala epione* on butter nut.

Meeting of November 10, 1912, in the Library, Mr. Buchholz presiding and eleven members present.

A letter was received from the Newark Museum Association asking our society to help to make up a collection of New Jersey insects. The secretary was ordered to inform them to have 12 exhibition cases ready for our society to fill with insects of our State.

Meeting of December 8, 1912, in the Free Public Library, Mr. Buchholz presiding and fourteen members present.

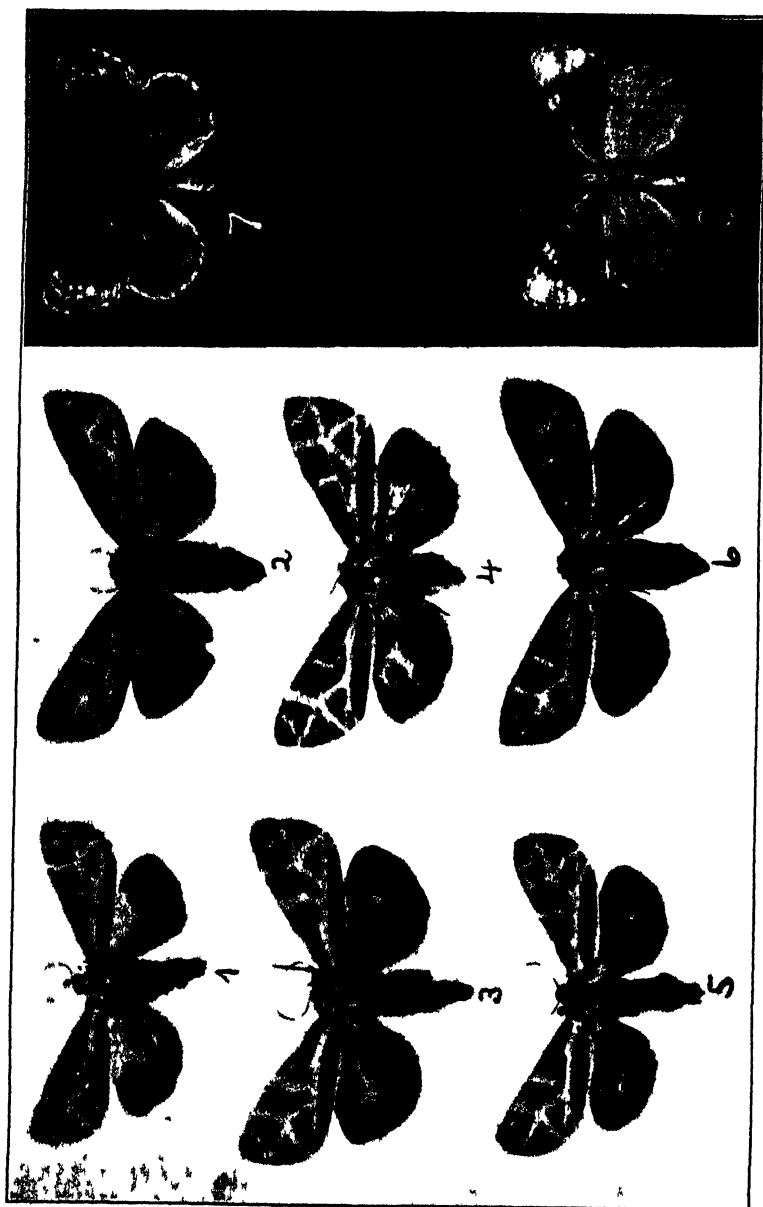
The following officers for the year 1913 were elected: President, Otto Buchholz, re-elected; Vice-President, Henry H. Brehme; Secretary, Frederick Lemmer, re-elected; Financial Secretary, T. David Mayfield, re-elected; Treasurer, George J. Keller, re-elected; Librarian, Louis Doerfel; Curator: Lepidoptera, Charles Rommel, Coleoptera and other orders, Ed. Bischoff, re-elected; trustee for three years, R. Schleckser; trustee for one year, John Angelman.

Mr. Harry Weiss, of New Brunswick, was elected a member.

FREDERICK LEMMER, *Secretary*.

Charles W. Hooker, Ph.D.

CHARLES W. HOOKER, PH.D., entomologist to the Federal Experiment Station and plant inspector of the Port of Mayaguez, Porto Rico, died on February 12, at the age of thirty, following an attack of appendicitis. Dr. Hooker, who was a graduate of Amherst College in the Class of 1906, received his doctor's degree in Entomology at the Massachusetts Agricultural College in 1909.—*Science*, March 7, 1913.



APANTESIS, 1-6, PHYCIODES, 7, 8 —BREHME

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXIV.

MAY, 1913.

No. 5.

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A Note on *Apantesis anna* and *persephone* (Lepid.).

By HERMAN H. BREHME, Newark, N. J.

(Plate VII, figs. 1-6.)

Arctia anna and *persephone* were described by Grote from a single female and a single male respectively. It has long been known that these names apply to forms of one species. *A. anna* is the less common form with wholly black hind wings and has been said by collectors to have no male. *A. persephone* is usually represented in collections by the forms having yellow hind wings with a broad black margin and a black discal lunule joined sometimes to the marginal band. This form occurs commonly in both sexes (Plate VII, Figs. 1 and 2). But with it are usually associated males of a form having the marginal band joined to the base of the wing by black bars on the costal and near the inner margins of the wing, and the yellow space left is sometimes almost completely filled in with black. The form with considerable yellow on the disk of the wing is, however, the one that Grote had before him when he named

persephone. Since, as above mentioned, both sexes of the yellow form occur, it is fair to assume that the blacker form is the male of *anna*. Indeed, as is shown by the extreme form of *persephone* (Fig. 5), there seems to be little doubt that occasionally males with wholly black wings do occur. In Fig. 3 is shown a specimen of typical *persephone*. From it will be seen the gradation into typical *anna*.

EXPLANATION OF PLATE VII.

Fig. 1 *Apantesis anna*, yellow form male.

Fig. 2 *Apantesis anna*, yellow form female.

Fig. 3 *Apantesis anna* v. *persephone*, typical male.

Figs. 4 and 5 *Apantesis*, intermediates between *persephone* and *anna*, males.

Fig. 6 *Apantesis anna*, typical female.

A new Aberration in *Phyciodes* (Lepid.).

By HERMAN H. BREHME, Newark, New Jersey.

(Plate VII, figs. 7 and 8)

***Phyciodes picta* Edw. ab. *jemezensis* n. ab.**

Above: Primaries black; three small fulvous spots in the discal cell; an outer row of six pale spots, the last two of which are fulvous and rather obscure; this row of spots is succeeded by a broken shade line of a yellow color which in the normal form of *picta* is almost absent. Secondaries also black, with an angular, rather broad fulvous band crossing the wing about one-third out. The band originates a little below the costa and extends only to a little below the cubital vein. An outer row of three or four very faint fulvous spots followed by an equally obscure whitish shade line more pronounced near the inner margin. Fringes of both wings as the normal form. Beneath as in normal specimens, but the black markings of the primaries are more suffused and the fulvous spots form a continuous band passing through the center of the wing. Two rather small brown spots which are not present in normal specimens are near the center of the yellow hind wings.

Type.—One male in the collection of the author.

Habitat.—Jemez Springs, New Mexico, June 21, 1912.

This handsome aberration was bred by Mr. John Woodgate along with numbers of the typical form.

EXPLANATION OF PLATE VII.

Fig. 7. Upper side, Fig. 8. Under side, of *Phyciodes picta*, n. ab. *jemezensis*.

Fragments on North American Insects—IV.

By A. A. GIRAULT, Nelson (Cairns), North Queensland,
Australia.

1. Duration of the Pupal Stadium of *Lucanus placidus* (Col.)

A nearly grown grub of this beetle was found just under the surface of the ground at the base of a stump at Blacksburg, Virginia, July 10, 1902. It was suitably confined, formed the prepupa about August 1, pupated on August 3 and became adult not until the sixth of October. It was not fed and died on October 21.

2. Asymmetry in *Telea polyphemus* Cramer (Lep.)

Two hundred and thirty-five eggs were deposited by a female of this species captured August 7, 1902, at Blacksburg, Virginia. A full-grown caterpillar taken from an oak tree on August 26 had the spiracle on the left side of the eighth abdominal segment missing, being replaced by a wartlike protuberance. Also, on the same side of the meson, in the lateral aspect, there were only seven of the oblique yellow stripes present, while eight were on the opposite side; the missing stripe was correlated with the missing spiracle; to complete the symmetry there should have been a stripe on the eighth abdominal segment. This caterpillar appeared to be parasitized, since there were present also several black-rimmed holes on one of the thoracic segments.

3. Duration of Egg Stage of *Prionoxystus robiniae* (Lep.).

Nine eggs deposited by a female captured at light, late P. M., June 2, 1902, hatched late P. M., June 17, 1902, or after about fifteen days. The larvae refused foliage of all kinds, but accepted twigs of locust. Blacksburg, Virginia.

4. *Epargyreus tityrus* (Lep.)

The caterpillars of this butterfly were very abundant at Annapolis, Maryland, during the latter part of September, 1902, on locust. They live singly in a cocoon-like shelter formed by tying together two leaves. When feeding they leave the shelter and this is usually done at night, though in the day an occasional larva may be seen crawling about. From several lar-

vae confined on September 25, three chrysalids were obtained two days later. The adults did not issue until the following June. Pupation occurs within the larval shelter.

5. *Pentilia misella* (Col.)

Pupae of this minute ladybeetle formed October 28, 1902, emerged November 19, 1902, at Salem, Virginia. About October 20, 1902, larvae were still numerous, but all had practically disappeared by the first of November.

6. *Nadata gibbosa* (Lep.)

A caterpillar of this species was obtained at Blacksburg, Virginia, June 23, 1902, from the trunk of an oak; it molted on June 30, losing the anal loop of yellow. On July 2 it commenced to construct a cocoon, completing it on July 4; July 6, pupa present; July 16, the adult emerged.

In the penultimate stadium the caterpillar is smooth and pale bluish green with red spiracles, large, prominent, broad, grayish head and a loop of yellow around the caudal margin of the anal shield. Also a few pale longitudinal stripes along the dorsum. A larva obtained crawling over the ground August 13, 1902, made a cocoon on August 15 and the chrysalid was formed on August 18. The pupa hibernated

7. *Coleoptera* Reared from Bullet Galls, *Holcaspis*.

During early March, 1903, at Blacksburg, Virginia, a small number of the old, vacated galls of several species of *Holcaspis* from oaks were kept in confinement with the result that several insects were obtained from them. On June 13, the lot was examined. The beetle *Otidocephalus laevicollis* Horn, as identified by Schwarz, was obtained in six instances. Two had already emerged, while four others were found when the galls were opened; they were within the larval case of the cynipid, the exit-hole of which was plugged with frass. The larvae of this beetle probably feed upon the substance of the gall, using the larval case of the cynipid for pupation. A single adult of *Hypothenemus dissimilis* and three of *Hemiptychus castaneus* were also obtained. These were likewise identified by Schwarz.

8. *Polynema psecas* Girault (Hymen.)

I have a single additional female specimen of this rather rare Mymarid captured in turf at Urbana, Illinois, April 22, 1909 (J. D. Hood). The second funicle joint was wholly black like the joints following it.

9. A New Locality for *Polynema consobrinus* Girault (Hymen.).

Mr. R. L. Webster has also sent me a single male specimen of this species on a slide labelled "On leaves of *Ptelea trifoliata*, associated with *Empoasca flavescens*, Ames, Iowa, July 15, 1911." He suggests that it may be parasitic upon the eggs of the *Empoasca*; the suggestion is probably true.

Last Year's Work with *Catocala* and other *Lepidoptera*.

By R. R. ROWLEY and L. BERRY, Louisiana, Missouri.

As in the previous spring, the eggs of *Catocala* were kept cool till a supply of young leaves was ready for the hatchlings, and the earliest larvae were those of *innubens* that emerged on the 5th of May, followed on the 7th by those of both *resecta* and *luciana*.

May 12th, a larva of *C. luciana*, feeding on willow and five days old, having hatched May 7th,

was nearly one-half an inch long, brown along the side, indistinctly striped longitudinally with lighter. Dorsum light with mid-longitudinal white or cream-colored band or stripe. Head a little flattened above, light brown or chestnut. The two hind prolegs only full length, the two pairs in front being short and unused, the front pair the shortest.

The larvae before the first moult is dirty ground color with a tinge of green. Head large and bright chestnut color.

May 18th, larva of *C. luciana* three-fourths of an inch long, tan or light brown with a flattened head like that of *cara* having a lateral black dash from the center above to the mouth. Inside of the dashes the color is brighter than that of the body. Dorsum lighter than the body color. A slight hump over the third pair of prolegs in a black cross band or patch as in *cara*. The 8th dorsal pair of tubercles stronger than the rest and black laterally. The mid-dorsal line quite yellow. The larva described was nearly an inch long. Others of a second lot but half an inch long and light brown.

May 23rd. The larvae of *luciana* one and one-fourth to one and one-half inches long, light brown. The head as in *cara*, flat and with lateral black dash or streak and inner elongate ellipses, two in number surrounded by narrow black. The true legs are a little lighter than the body color. The hump over the third abdominal prolegs is low, deeper brown with yellow crest. The tubercles are reddish brown. The last

two pairs of prolegs are very light, almost cream color, outside flanked by very dark brown.

On May 26th larvae of *Catocala luciana* after 4th (?) moult, somewhat lighter color than before the moult, but taking on a grayish tinge, a day or two later. The hump over the third pair of prolegs red brown. Head, the same color. Lateral setae short but thick. The larvae at this time were nearly two inches long.

May 29th. Grown larvae of *Catocala luciana* two and one-half inches long, light brown, with a reddish tint. Tubercles deeper red brown. Head, as in *cara* with yellow lobes above and a lateral brown facial dash. The true legs, body color. Prolegs slightly browner. The body indistinctly lined longitudinally. Lateral setae very short.

There are two colors that prevailed among the larvae, one light reddish brown and the other slightly bluer or with a leaden tint.

It is proper to state in this connection that the chrysalids from these larvae gave two types of imagoes, possibly distinct specifically. The eggs were laid by two females and sent to the senior author, the autumn before, from Denver, Colorado.

At the time the senior author visited the locality on the Platte River and took numbers of the moths under the wagon bridge over that stream, none other than *luciana* were seen among the scores that were frightened from their hiding places. It was hardly more than a week from that time that Mr. Dulany obtained the females that laid the eggs mentioned above.

On June 1st there is this record on *luciana*. Larvae very light gray with a small, somewhat darker cross hump over the third abdominal prolegs. The darker larvae remind one of *parta* caterpillars, the lighter ones of *concombens*. The first larva began spinning under paper on the above date, 25 days from hatching.

The larvae of *C. luciana* spun from the 1st to the 6th of June while the *resecta* began on the 5th.

The pupae of *Catocala luciana* gave the first imagoes of that species on July 3d. Both were males. This is nearly a month earlier than the species appears in Colorado. The chrysalis period of this moth is one month as the larvae of these two moths pupated in the first week of June.

The first female imagoes of *C. luciana* emerged on the 6th of July.

The larva of *C. luciana* spins a thin cocoon in leaves like that of *cara* and others, and the pupa is brown, covered by a whitish pruinescence as in *cara*.

The *innubens* larvae, as in past years, were little trouble to rear, being perfectly healthy, and rapidly matured, but, from crowding in the jars, were a little undersized. All were *hinda* as was their mother. Among the earliest moths taken in the woods in the last three years by the senior author were a few beautiful specimens of this variety with a white spot set in a faintly purplish fore wing.

On his first visit to "Catocala Hollow," June 27th, George Dulany took two *hinda* along with *ilia* and *epione*. During the succeeding two or three weeks this same moth was found abundant, resting on the tree trunks near the ground, often half a dozen of them flying off on our near approach. One small tree especially seemed to be very attractive to these "Cato-moths" and equally attractive to us as we took some beauties there. This was near the entrance to the hollow, where trees were few, a little to the left of the path just as it ascended a steep hillock, in a clump of bushes and young trees.

The larvae of *Catocala innubens* that hatched May 5th began spinning in the honey locust foliage in three weeks and were chrysalids in a month from the time they began eating.

The first imago of *Catocala innubens* from bred pupae emerged June 27th.

On the 8th of May the eggs of *Catocala vidua* hatched.

On June 8th many of the *vidua* larvae were passing their last moult and were nearly two and a half inches long.

After moulting, the caterpillars are very light pinkish gray with indistinct longitudinal lines and bands of darker dots. The cross band between the third and fourth prolegs on the dorsum, very dark brown. Lateral setae about as long as in *resecta*. The head, pinkish brown with cream-colored longitudinal wavy lines. No cheek dash of black but the front edge of the head shield is black. Tubercles flesh color. True legs, flesh color. The underside of the body is pale greenish with a midventral row of black spots.

Some days after the last moult, the larvae of *C. vidua* present white ventral surface with central row of black spots in red brown spots.

June 14th. Full grown larvae of *C. vidua* are three inches long, ashen gray with cream-colored tubercles. A row of lateral setae. The body covered by minute black dots that more or less arrange themselves in longitudinal lines that outline indistinct longitudinal bands, thirteen in number. A dark cross band over the dorsum between the third and fourth pairs of prolegs. The true, as well as the prolegs, are body color. Head, light gray with red brown irregular lines. A slight black dash either side of the mouth. Some specimens have a slight reddish tint while others are slightly darker gray. All larvae before the last moult are reddish.

On the 15th of June the first *vidua* larva began to spin.

From overcrowding, disease carried off a number of the larvae of *vidua* and *pernyi*.

The larvae of both *vidua* and *resecta* likewise spin their cocoons between leaves and the pupae, as in other species, are brown, covered by a white pruinescence.

The first imago of *Catocala vidua* emerged on July 20th, a full month after pupation, allowing five days between spinning and pupation.

On May 26th the larvae of *Catocala resecta* were about two inches long.

On June 1st, about two and three-fourth inches long, dark uniform gray with a broad, illly-defined cross, dark brown band between the 3rd and 4th abdominal segments. These larvae hatched May 7th.

June 8th. The larvae of *C. resecta* fully grown, measuring two and three-fourth inches, light gray with longitudinal lines of wavy dots and dashes. The cross band between the third and fourth pairs of prolegs, somewhat darker than the general body color. The tubercles cream color. Lateral setae present. The head has the color of the rest of the body, with black cheek dash. The longitudinal dark lines form narrow bands.

A larva of *Catocala minuta*, found feeding on honey locust by the junior author, was one and three-eighths inches long on

June 6th, dark brown with light gray patches. Head, small, gray, flat. A slight hump over the first abdominal segment with a minute black dot on each side. The hump is gray. There is a cross hump between the second and third abdominal prolegs on the dorsum, gray in front and darker behind with a small white crest. There is a lateral row of short setae. A sharp crest is over the eighth abdominal segment as in other *Catocala* larvae. The ventral side is pale green with a row of medial black spots.

The larva of *Catocala minuta* spun on June 7th and the pupa gave an imago on June 30th.

On the same day, May 23d, eggs of *Smerinthus ophthalmicus*, received from Mr. E. A. Dodge, of Santa Cruz, California, hatched. The young larvae were white with large, greenish heads and strong brown caudal horns, curved backward. The eggs were small, and often with red rims, as in ova of *Sm. geminatus*, *myops*, *modesta* and *excaecatus*. In fact, *ophthalmicus* eggs are hardly distinguishable from those of *excaecatus* in size and shape.

May 29th. Larvae of *Smerinthus ophthalmicus*, hatched on the 23rd, moulted for the first time on the 27th. After the first moult the "worm" is light green with a light, almost white lateral line. Head pointed above. Caudal horn strong, directed backward, yellow green with a rich red brown line at the base. The horn nearly half an inch long.

June 2nd. Larva after second moult, three-fourths of an inch long, light green with light toothed lines. Caudal horn light with faint violet at the base. Head, triangular. Much like *excaecatus*.

The larvae moulted the third time on June 7th. After the third moult, the larvae are one and one-fourth inches long, dark green with pale yellow, toothed sphingial bands or lines. Small pale yellow granules cover the body. The head is blunt triangular, hardly sharp at the apex, dark green with strong yellow facial lines (one to each side). The last sphingial band extends to the base of the caudal horn and is stronger and yellower than the other bands, except the facial bands. The caudal horn rather strong, medium length, directed backward and but little curved. The horn is rosy on the sides and behind nearly to the apex where it is yellow green. The front side of the horn is blue. The true legs are rosy with green bases. The prolegs are of the body color. The caudal shield has a yellow edge.

On June 16th the larvae were two and one-fourth to two and one-half inches long, yellow-green with lighter granules. Longitudinal lines that bound the dorsum and the sphingial bands are pale white or yellowish. The last sphingial band extends from the middle of the sixth segment to the base of the caudal horn and is strong and yellow. The head is triangular, rather sharp and bluish in front with lateral yellow band. The true legs are pale red. The caudal horn nearly straight, directed backward, blue in front and violet behind. Spiracles small, elliptical, almost black with yellow centers.

The first larva of *S. ophthalmicus* burrowed on June 16th. On the same date the *Smerinthus geminatus* larvae began burrowing.

The mature larva of *Sm. ophthalmicus* burrows about as deeply as that of *excaecatus* and the chrysalis is about the

same size and color as that of the latter, being one and one-half inches long, thick, dark brown, probably as dark as that of *geminatus*.

The first two imagoes, male and female, of *ophthalmicus* emerged during the night of July 8-9 and both were deformed, twenty-one and twenty-two days from burrowing or fifteen to sixteen days from pupation.

The deformed female *ophthalmicus* laid one hundred and thirty-two eggs, a number of which were infertile. A part of these eggs were sent to the junior author, who secured imagoes from them, while the senior author signally failed to rear the larvae of the rest.

On July 10th two splendid females of *ophthalmicus* emerged.

Eggs of *Sm. ophthalmicus* hatched six days after they were laid. In color the egg is pale yellow, a little flattened, elliptical and usually with a peripheral red streak halfway around.

The deformed female *Sm. ophthalmicus* died the night after she laid the one hundred and thirty-two eggs, or two days after emergence. The deformed male companion to the female died four days after emergence.

On the same day that the *resecta* and *luciana* eggs hatched, May 7th, the ova of *Antherea pernyi* gave larvae and, on the afternoon of that day, those of *Cricula andrei*. These latter two are Asiatic Saturnids, the first a second cousin of our own splendid *polyphemus* and the other distantly related to *io*, possessing his stinging qualities.

On the 12th of June the first larva of *Antherea pernyi* began to spin, thirty-six days after the first eggs hatched. On the 13th four larvae of *Cricula andrei* began their cocoons, thirty-seven days from hatching.

The larvae of *Antherea pernyi* and *Cricula andrei* continued to cocoon till June 26th and those of *Catocala vidua* till the 29th.

The first *A. pernyi*, a female and deformed, came from the cocoon on the 14th of July. A male of that species emerged at 4 o'clock P. M. the same day and these were all that the fifteen or sixteen cocoons ever gave. After spinning, the larvae died without pupating. Allowing six to eight days after

beginning the cocoon before pupating, the chrysalis period of *pernyi* is about twenty-four or twenty-five days.

The first imagoes of *Cricula andrei* appeared on July 10th, twenty-seven days from the time they began spinning their cocoons.

The first imago of *Cressonia juglandis* from autumn chrysalis emerged on the 29th of May.

Eggs of *Catocala relictæ* furnished by the junior author hatched on the 23d of May.

From captured females of *Sm. excaecatus* and *geminatus*, ova were laid respectively on the 18th and 22d of May and the larvae hatched and in due time pupated, those of the former failing to a one to give imagoes in the summer and autumn, while the *geminatus* chrysalids yielded moths in July.

Eggs from a captured female *polyphemus* were laid May 20th.

May 25th, eggs of *Actias luna* hatched.

The first imago of *Everyx versicolor* from pupae received from New Jersey emerged May 25th.

June 15th, I found two larvae of *Catocala neogama* and one of *C. piatrix* between shingles leaning against a small walnut tree. All three of these were small, probably past second moult. We have referred to the shingle trap in a previous paper on *Catocala* larvae.

Mr. George Dulany took imagoes of *Catocala epione*, *ilia* and *innubens* in the woods on June 27th.

On June 28th, the senior author, accompanied by Mr. Dulany, visited "Catocala Hollow" and took seven *Catocala epione*, two *polygama*, two *innubens* and sixteen *ilia*, including a white spotted one of the latter species. At the same time we took a *Ceratonia undulosa* moth.

The first larva of *Smerinthus excaecatus* burrowed on July 1st.

Imagoes of *Sm. geminatus* emerged on July 5th, twenty days from burrowing and fourteen or fifteen days from pupation.

On July 6th, took in the woods, in addition to species captured on the previous day, two beautiful specimens of *Catocala*

insolabilis and saw a specimen of *ultronia*. The *insolabilis* were taken on a small linden tree.

The first *Catocala piatrix* larva spun on July 9th. The first imagoes of *C. resecta* emerged on July 10th, about thirty-five days from burrowing or thirty days from pupation.

The first imago of *Citheronia regalis* emerged on July 4th.

A second *regalis* slipped its chrysalis skin on the 9th of July. On July 5th, in company with Ralph Dodge, the senior author took, in the woods, *C. innubens*, *scintillans*, *amica*, *neogama*, *palaeogama* and a fine *parta*. Ralph captured two fine *nebulosa* and a number of *ilia* and *polygama*.

The first *C. neogama* from a chrysalis was on July 11th.

Captured a fine male *regalis* at light on July 20th.

The senior author took a few *Catocala residua* in the woods from July 20th to August 10th. The pupal state of *Catocala relictia* is about sixteen to eighteen days.

Moths of the second brood of imagoes of *polyphemus* from July 20th to 26th, the eggs having been laid in May. The imagoes of the second brood are redder than those of the first or spring brood.

The first *Catocala cara* taken in the woods in 1912 were captured on the 27th of July. The first *lacrymosa* on the same day, a fine *evelina*, and saw the first *viduata*. The first *resecta* was taken on July 29th, as also the first *phalanga* and *habilis*.

On the same date took three other *lacrymosa* and a splendid *viduata*.

On the 29th, the senior author took in the woods, thirteen species and two good varieties of *Catocala*.

The cocoons of the second brood of *polyphemus* gave imagoes in from twenty-five to twenty-seven days from the time the larvae began to spin.

July 29th was the best *Catocala* day of the season. The weather was warm, dry and cloudless and numbers of the moths were low on the tree trunks. On the 31st, a day in every respect a duplicate of the 29th as to weather, few moths were to be seen in the woods, and they were mostly high on the trees.

On July 31st, a single specimen of *Euparthenos nubilis* was taken in "Catocala Hollow."

A brood of *Papilio philenor* larvae feeding on *Aristolochia sipho* and *serpentaria* in the back yard of the senior author were ready to pupate on the 4th of August.

The first *vidua* of the season in the woods was taken on the 16th of August.

A full grown larva of *Catocala piatrix* was found feeding on walnut, August the 9th.

Sugaring on the night of the 17th of August, a number of specimens of *Catocala cara*, *vidua*, *habilis*, *resecta* and *residua*, two hawk moths and a number of Homoptera were taken by the senior author and Mr. G. W. Dulany.

On September 14th, accompanied by Prof. F. E. Alsup and Harold Davenport, the senior author took one *Catocala robinsoni*, the first of the season, battered specimens of a number of other Catocalae, *Deiopeia bella* and larvae and chrysalids of *Anaea andria*.

The rest of the season was spent rearing larvae of *Anaea andria*, the last of which pupated October 18th.

In much of the work of rearing larvae, during last summer, the Senior Author was kindly assisted by Mr. G. W. Dulany.

Seven New North American Bees of the Genus *Halictus* (Hym.).

By MRS. MARION DURBIN ELLIS, Boulder, Colorado.

During the study of some material of the genus *Halictus*, in the collection of Professor T. D. A. Cockerell, the following new species were distinguished. These species all belong to the sub-genus *Chloralictus* Robertson and are further characterized by the more or less distinctly metallic, green or blue abdomen. The work was done in the Zoological laboratory of the University of Colorado, under the direction of Professor Cockerell.

Halictus succinipennis sp. nov.

♀.—length about seven (7) mm. Head, thorax, and abdomen, metallic green. Face much longer than wide, slightly concave toward

the antennal fossae; clypeus produced half its length beyond the lower margin of the eye; face opaque except over the clypeus and frons, at the lower tip of the median carina; very closely punctured above and finely roughened below. Mesothorax opaque throughout, rather finely and very closely punctured, and finely roughened; parapsidal grooves short, median groove distinct, much deeper in front. The disc of the scutum blue-green, the scutellum and postscutellum brassy-green. Basal area of the metathorax with a low, rounded, finely roughened rim with numerous very crooked rugae, which are straighter and more distinct near the sides. Tegulae pale testaceous. Wings amber hyaline; stigma and nervures pale testaceous. Tarsi dark brown. Abdomen rather broad and blunt, rich metallic green; the disc of even the first segment finely punctured; the very narrow apical margin of each segment testaceous, segments 3 to 5 densely covered with short, closely appressed, pale grayish or whitish hair. Pubescence comparatively abundant and whitish throughout, somewhat ochraceous on the legs and scutellum.

Hab. Florissant, Colorado, two (= type), 6.9 mm. long, on sand, June 14, 1908 (S. A. Rohwer); one nearly 7 mm. long, June 21, 1908, (S. A. Rohwer) one 7 mm., June 23, 1907 (S. A. Rohwer).

This species is very near *H. pruinus* Rob. from which it differs in the yellow wings, and finely punctured disc of the first abdominal segment. The pubescence of the abdomen is not yellow as in *H. pilosus* Sm.

***Halictus pavoninus* sp. nov.**

♀.—Head and mesothorax dark, greenish blue; basal area of the metathorax and the abdomen darker blue. Head a little longer than broad, narrowed below and with the clypeus produced so that the face appears triangular, eyes narrow; face finely and closely punctured, only the frons and clypeus shiny; under side of the flagellum dusky testaceous. Mesopleura with shallow, coarse, irregular punctures; upper end of the metapleura with three or four irregular plicae directed toward its upper anterior angle; mesonotum somewhat shiny in spite of the numerous, close, rather fine punctures. Basal area of the metathorax without a rim, the edge broadly rounded and finely roughened, slightly indented at the middle, plicae weak, numerous, and irregular. Tegulae pale testaceous, darker at the base. Wings brownish hyaline; third submarginal cell one and one-half as wide as the second; stigma dusky testaceous, nervures dusky testaceous to dark brown on the costal nervure. Legs black to piceous, inner spur of the hind tibia with a series of four or five graduated teeth. Abdomen

sharp behind; disc of the first segment very shiny, the others a little less so, all the segments very finely punctured, less conspicuously lineolated; apical margins of the segments testaceous; discs of segments 4 and 5 and the sides of the other segments covered with thin, short, pale gray hairs, thicker and more ochraceous around the anal rima. Pubescence scant, not very dense even on the legs, where it is pale yellowish gray; whitish below.

Hab. Tolland, Colorado, altitude 8,900 ft. one (= type) 6 mm., near the Mountain Laboratory.

This species seems to be related to *H. veganus* Ckll., from which it may be distinguished by the longer face, and the closely punctured mesonotum which is not opaque with fine lineolations.

***Halictus lazulis* sp. nov.**

♀.—Length about six (6) mm. Much like *H. pruiniformis* Crawl. in general contour, rich peacock blue throughout. Face very slightly longer than broad; opaque, the punctures moderately coarse and very close; the small tubercle beneath the eye and those at the outer corners of the clypeus well developed; clypeus produced, so that three-fourths of it lies below the lower margin of the eyes; color on the under side of the flagellum pronounced. Mesothorax opaque, rather coarsely and very closely punctured; median groove of the disc distinct, parapsidal grooves poorly developed. Metathorax with a low, narrow rim, indented at the middle, around the comparatively broad basal area; basal area with a middle ridge decidedly pronounced, the plicæ just on either side of this central one irregular and very weak, but becoming more distinct laterally. Tegulæ testaceous. Wings amber hyaline; stigma pale testaceous, the nervures rich reddish brown to testaceous. Legs black to piceous; inner spur of the hind tarsi with three large and one small clavate teeth. Abdomen not stout, acutely pointed behind; very shiny, finely punctured and openly lineolated dorsally; ventral side and narrow apical margins of each segment, above, dark testaceous; segments 4 and 5, and sides of segment 3, with rather dense, short, closely appressed, pale greyish hairs. Pubescence very scant except on the legs and abdomen; pale grey tinged with buffy above, more whitish below.

Hab. Florissant, Colorado, one nearly 6 mm. on sand, June 14, 1907 (S. A. Rohwer); one about 6 mm. long at flowers of *Argentina anserina* (L.), June 23, 1907. (S. A. Rohwer).

This species looks more like *H. pruiniformis* Crawl. than any other, but is easily distinguished by its amber wings, closely punctured disc of the mesothorax, and dark blue color.

***Halictus tenuis* sp. nov.**

♀.—Length, 5 mm. A small slender species, metallic blue throughout. Facial quadrangle a little broader than long, clypeus short but distinctly produced, face finely and very closely punctured, opaque except on the almost impunctate frons and on the clypeus; flagellum tinged with yellow below. Pleuræ rather coarsely but not sharply roughened, metapleuræ with five or six, very weak plicæ near the upper end; mesonotum almost opaque with fine scattered punctures and very sharp, rather coarse lineolations; median groove deep, parapsidal grooves not developed. Basal area of the metathorax, almost as broad as the scutellum, the margin rounded, a little elevated near the middle; the surface sharply lineolated, a few very weak, irregular, reticulate rugæ near the base, the middle one straight, and somewhat stronger. Tegulæ brown in the middle, almost hyaline at the edge. Wings light brownish hyaline, third submarginal cell almost twice as wide as the first; stigma dusky honey color, nervures darker, costal nervure dark brown. Legs black, tarsi dark testaceous. Abdomen shiny, with very fine scattered punctures and very fine lineolations, margins of the segments testaceous. Pubescence scant except around the anal rima and on the legs; pale gray below, faintly buffy above.

Hab. Sugar Loaf Mountain, Colorado, altitude 8,500 ft. one (= type) 5 mm. long, May 18, 1907 (S. A. Rohwer).

This species is much like *H. veganus* Ckll., from which it differs in being blue, not green, and in having no distinct rim around the basal area of the metathorax; it also resembles *H. pruiniformis* Crawf. from which the well-separated, finer punctures, and the sharper, more distinct lineolations of the mesonotum, and the very weak rugæ of the basal area of the metathorax, distinguish it.

***Halictus umbripennis* sp. nov.**

♀.—Length, 7 mm. Head and thorax metallic, olive green, abdomen quite as metallic, but more brown. Facial quadrangle as broad as long, somewhat shiny, although finely and closely punctured; clypeus only a very little produced, its apical two-fifths purplish black; flagellum not conspicuously colored below; cheeks shiny, the punctures fine and scattered. Mesothorax shiny throughout; median groove of the mesonotum deep in front, but scarcely evident behind the tegulæ, parapsidal grooves distinct but not deep; disc with very fine scattered punctures (not quite so smooth as *H. zephyrus* Sm.), and with microscopic lineolations; scutellum almost impunctate; postscutellum closely punctured. Metathorax without a salient rim, broadly rounded from above down-

wards, and very shiny; the basal area narrow, finely roughened, and with very few (less than twenty), short ridges. Tegulae brown. Wings dusky hyaline, with a faint cloud toward the apex; stigma and nervures almost black. Femora shiny black; tibiae and tarsi brown, and with ochraceous pubescence. Abdomen rather broad and blunt, shiny throughout; discs of all the segments very finely punctured, their apical margins impunctate but distinctly lineolate; those of segments 2 and 3 appear a very little contracted, so that the rest of the segment bulges slightly above the margin. Pubescence very scant, whitish below and buffy above.

Hab. Quirigua, Guatemala, one (=type) nearly 7 mm. February 1912, (Mrs. W. P. Cockerell).

This species is most closely related to *H. zephyrus* Sm.; from which its larger size, olive color, absence of testaceous margins on the abdominal segments, and the almost black nervures of the wings, easily distinguish it.

Halictus cattellae sp. nov.

♀ Length 7 mm. Head, mesopleurae and metathorax, blue green; mesonotum brassy, olive green; abdomen very dark olive green, the apical margins of the segments dark brown. Facial quadrangle about square; lateral margins of the clypeus free, the lower corners of the eyes long; face opaque, finely and very closely punctured above the antennae, less closely punctured but finely roughened below. Mesopleura coarsely punctured; the upper half of the metapleura with short irregular plicae crossing it at right angles; mesonotum opaque, rather coarsely, and closely punctured, and finely and sharply roughened, median and parapsidal grooves long but not deep. Basal area of the metathorax narrow, its edge broadly rounded, slightly elevated and indented at the middle, finely lineolate, and with a few short, simple plicae. Tegulae dark testaceous. Wings dusky, amber hyaline; costal nervure reddish brown, stigma and other nervures dusky honey color. Legs piceous to black, tarsi reddish brown. Abdomen broadest at the second segment; very shiny throughout, punctures very fine and widely scattered on the discs of all the segments, even less distinct on the first; the dark brown apical margin of each segment almost impunctate. Pubescence scant except around the anal rima and on the legs; ochraceous above, more whitish below.

♂ Length 7.5 mm. Like the female in sculpture and color of the thorax and venation and color of the wings. Face and abdomen brassy like the mesonotum. Clypeus much produced, entirely brassy like the face, labrum pale yellow, entire under side of the flagellum ochraceous. Tegulae light testaceous, legs black to dark brown, knees

and tarsi light testaceous. Abdomen slender, the end blunt; discs of all the segments finely punctured and inconspicuously lineolate, the apical margins and the ventral side of the segments dark brown. Pubescence rather scant, deep ochraceous on the vertex and dorsal half of the thorax, and pale gray on the face, cheeks and legs.

Hab. Garrison, New York, one ♀ (=type), nearly 7 mm. long, (Eleth Cattell); two ♀ nearly 7 mm. long (Eleth Cattell); Woods Hole, Massachusetts, one ♂ almost 7.5 mm. long, June, (T. D. A. Cockerell).

This species and the next seem more related to each other than to any other species; they probably belong to a group with *H. aquilae* Ckll., and *H. nymphæarum* Rob., since they all have plicæ on the metapleura. The very rough mesonotum suggests *H. pilosus* Sm., from which the short round face of *H. cattellæ* distinguishes it. *H. cattellæ* may be separated from *H. perpunctatus* n. sp. by the entirely shiny abdomen, and the few, simple plicæ of the basal area of the metathorax.

***Halictus perpunctatus* sp. nov.**

Female. Length about 6 to 6.5 mm. Head and thorax metallic, blue-green, abdomen brown with more or less distinct, blue-green metallic reflections, the margins of the segments brown shading to pale testaceous on the edge. Face a very little longer than broad; clypeus produced, its lateral margins entirely free, the broad lower margin shiny black, toothed along the edge; face finely and closely punctured above the antennae, a little more coarsely and scatteringly below, frons and clypeus shiny; cheeks rather full and shiny, although finely punctured. Mesopleura with coarse scattered punctures of irregular shape; slender plicæ crossing the upper half of the metapleura, becoming very weak and broken below the middle; mesonotum opaque, rather coarsely and *very closely punctured*; median groove well developed, parapsidal grooves faint. Basal area of the metathorax almost as wide as the scutellum; with a low, sharp rim extending well laterally; rugæ strong and rather numerous, reticulate near the middle. Tegulae bright brown. Wings hyaline; stigma and nervures pale honey color, costal nervure darker. Legs black, shading to brown on the tarsi; inner spur of the hind tibia with two large and three rather abruptly, smaller, clavate teeth. Abdomen stout; disc of the first segment very shiny, the few scattered punctures very fine and shallow, disc of all the other segments with the punctures fine, sharp and close together; segments 3 to 5 closely

covered with thin, short, pale yellowish gray hair, the last four segments showing the metallic reflections more distinctly than the first. Pubescence only moderately scant, abundant on the legs; pale gray throughout.

Hab. Boulder, Colorado; one (= type) 5.5 mm. long, at flowers of *Claytonia rosea* Rybd., April 20 (T. D. A. Cockerell); one 6 mm. at the flowers of *Bursa bursa-pastoris* (L.), May 22, 1907 (G. M. Hite); one 6.7 mm. long, June 10, 1907 (G. M. Hite); one 6.5 mm. long at flowers of *Taraxacum taraxacum* (L.), April 16, 1908 (S. A. Rohwer); and Rito de los Frijoles, New Mexico, five 6 to 6.5 mm. long, August 1910 (W. W. Robbins).

This species probably belongs to the group of *H. nymphaearum* Rob. and is most closely related to *H. cattellae*. The closely punctured mesonotum distinguishes it from all the species of the group except *H. cattellae*, from which it differs in having a longer face, a rim around the basal area of the metathorax, and a closely punctured disc of the second abdominal segment. Individuals of *H. perpunctatus* with but little of the metallic reflection on the abdomen somewhat resemble *H. perdifficilis* Ckll. from which the broad basal area of the metathorax, the sharply lineolate mesonotum and the whitish, not yellowish gray of the pubescence on the abdomen separates it.

A Twelfth New Genus of Hymenoptera Trichogrammatidae from Australia.

By A. A. GIRAULT, Nelson (Cairns), North Queensland,
Australia.

LATHROMEROIDES new genus.

(Hymenoptera Chalcidoidea, Family Trichogrammatidae, Subfamily Chaetostichinae, Tribe Lathromerini.)

Female.—Similar to *Lathromerella* Girault, but the antennal club only three-jointed and not terminating in a spinelike seta, the discal ciliation of the fore wing dense and together with the venation as in *Aphelinoidea*, the marginal cilia of the fore wing very short; moreover, the abdomen is very long and tubular, nearly twice the length of the head and thorax

combined, the very long ovipositor inserted at the base of the abdomen and distinctly projecting beyond the latter's tip for a length equal to about a seventh or eighth that of the slender, tapering abdomen. Stigmal vein merely a very short, foot-like projection from the marginal; postmarginal vein absent. Posterior wings with moderately long marginal fringes caudad, bearing five longitudinal lines of discal ciliation. Also resembling *Tumidiclava* Girault, but the abdomen is totally different, the antennal club does not terminate in a spine-like seta and is not so swollen, while the discal ciliation of the fore wing is dense and normal. The distal joint of the club forms over half the length of that segment. One ring joint; no funicle. Cephalic tibial spur present, short and straight. Tarsal joints rather long. Thorax with a median sulcus.

Male.—Not known.

In my table of genera *Lathromeroides* will drop in near *Pterygogramma* and *Uscana*, but the very long, tubular abdomen, very dense discal ciliation, very short stigmal vein and the distinctly exerted ovipositor readily distinguish it.

Type.—The following species:

1. *Lathromeroides longicorpus*, new species.

Female.—Length, 1.00 mm. Bright golden yellow, the eyes and ocelli bright garnet, the exerted portion of the valves of the ovipositor and a small, dot-like spot under the stigmal vein deep black, the distal tarsal joints and the antennae more or less dusky. Wings slightly embrowned under the venation. Legs uniformly pallid yellowish. Intermediate joint of cephalic tarsus shortest, the other two sub-equal; longest tarsal joint is the proximal joint of intermediate legs. Wings moderate in width, convexly rounded at apex. Proximal two joints of antennal club wider than long.

(From a single specimen, 2-3 inch objective, 1 inch optic, Bausch and Lomb.)

Male.—Not known.

Described from a single female specimen captured from a window, men's quarters, mill yard, Proserpine, Q., November 4, 1912.

Habitat.—Australia—Proserpine, Queensland.

Type.—No. Hy. 1271, Queensland Museum, Brisbane, the above specimen in xylol-balsam.

Standards of the Number of Eggs laid by Spiders—II.*

Being Averages Obtained by Actual Count of the Combined Eggs of Twenty (20) Depositions or Masses.

By A. A. GIRAULT, Nelson (Cairns), North Queensland, Australia.

2. THERIDIUM TEPIDARIORUM C. Koch.

No.	Date 1911	No counted per mass	Successive Totals	Av. per Egg Mass	Max. Min.	Range
1	Chicago, July 20	341.	341.	341.	477.	
2		382.	723.	361.		
3		477.	1200.	400.		
4		211.	1411.	353.		
5		244.	1655.	331.		
6		248.	1903.	317.		
7		233.	2136.	305.		
8		394.	2530.	316.		
9	Urbana, July 31	209.	2739.	304.	182.	
10		221.	2960.	296.		
11		182.	3142.	286.		
12		298.	3440.	287.		
13		217.	3657.	281.		
14		258.	3915.	279.		
15		381.	4296.	286.		
16		252.	4548.	284.		
17		296.	4844.	285.		
18		217.	5061.	281.		
19		249.	5310.	279.		
20		232.	5542.	277.		295
20			5542.	277.	477. 182.	51

The first eight of these masses were collected in a small pumping station on the shore of Lake Michigan, Chicago, Illinois, July 20, 1911; the other twelve at Urbana, Illinois, July 31, 1911, in the cellar of a building on the campus of the University of Illinois. As many as three of the globular, brownish egg cocoons have been observed in a single web, but I believe that as many as five have been recorded. The average obtained then represents approximately what number of eggs will be found in each cocoon and not the average expectations from any single female which must be near from three to five times more. The numbers 3, 4 and 5, 6 and 7 respectively are each from one nest, so that we may be assured that a female may lay as many as 477, 455 and 481 eggs. It is also plain that one female may put as many eggs in one cocoon as another does in two.

* For the first of this series, see ENT. NEWS, XXII, pp. 461-462, Dec., 1911.

Collecting Notes from the Great Basin and Adjoining Territory (Dipt., Col.).*

By J. M. ALDRICH, Moscow, Idaho.

In the summer of 1911 I traveled about 5000 miles in a 62-day expedition having for its main object the study of the insects found in and about the western salt and alkaline lakes. Although I have published four articles on my results and have another in press, there are so many facts of entomological interest remaining that a more general discussion of the theme seems to be required. Much of my material outside the *Diptera* still remains unidentified, hence it is even yet impossible to give a list of the species collected. Nor do I think such a list wholly desirable, as it would contain only here and there a species of real interest, nine-tenths being comparatively common and widespread insects. The better way would be to enumerate only species not heretofore known in the territory under consideration, or those whose distribution is little understood. This plan will be pursued with the *Diptera*, while other orders must wait indefinitely.

The first three weeks of the trip were spent with a farmers' institute party from the University of Idaho, to whom had been assigned a schedule of institutes mostly in rather out-of-the-way places. Our itinerary took us to Payette Lake and down Long Valley to the southward, a fine collecting ground for all kinds of insects, and now becoming accessible through the construction of a branch railroad from Nampa. We were there too early, about June 20; nearly a month later would have been better. The valley is bordered on both sides by heavily timbered and snow-capped mountains, the summits being only a few miles from civilization, ideal for entomological work. Along the main line of the Oregon Short Line as we progressed eastward there is nothing of especial interest in the way of a collecting ground until Pocatello is passed. East of this point the railroad enters a mountain valley, and the entomological field is highly interesting until the Wyoming line is reached. We left the railroad at Montpelier and made

*Part of the results of an investigation made by aid of an appropriation from the Elizabeth Thompson Science Fund.

the interior points of St. Charles and Liberty. This also is a high country and it was early for good collecting. The next and concluding institute was at Malad City on July 3, and from here my trip of investigation began. I had collected so far only the following Diptera of special interest:

At McCall, Idaho, on Payette Lake, *Asemosyrphus mexicanus*.

At Council, *Atherix variegata*.

At Boise, *Heteropterina nasoni* and *n. sp.*

At Soldier, *Tabanus phacnops*.

At Bellevue, *Campsicnemus thersites*, *Dolichopus coquilletti*, *Chrysopila tomentosa*.

At McCammon, *Pelina truncatula*, *Tephritis clathrata*.

On the roundabout railroad trip into Malad, a day had been spent on a side trip to the Utah Agricultural College at Logan; while awaiting the train at Cache Junction, I collected *Dolichopus amnicola* and *Hydrophorus gratiosus* Ald. In Logan I found *Chiromyia* (*Scyphella*) *flava* common on a stable window.

At Brigham City, Utah, on July 4 and 5, I spent the available time at Box Elder Lake, an expanse of brackish, shallow water about two miles north of town. On the way thither along the railroad were great quantities of parsnip in bloom. On these I got three species of *Thereva* and specimens of *Helophilus similis* and *Sarcophila* (*Paraphyto*) *opaca*. Along the shores of the lake or pond I found a new species of *Lispa* (described in a forthcoming paper), also *Ephydra subopaca*, which breeds in the salt waters; in the adjacent grasses along a waste water ditch occurred *Melieria occidentalis* and a new species of *Pelastoneurus*, while I was attacked by *Chrysops discalis*, *fulvaster* and *mocrens*. On the bare mud, where the lake had recently dried away, there were many specimens of *Cicindela echo*, somewhat difficult to capture from a bad habit of flying a long distance when flushed; they enter the shallow water fearlessly and run about in it where it is a quarter or three-eighths of an inch deep, capturing some kind of prey there. In this situation they are unable to take wing, and I picked up a few specimens from the water in my fin-

gers. This habit in a *Cicindela* was new to me. In the vicinity of the pond I got *Dolichopus afflictus*, which is unusual so far east, although it has been reported from Wyoming.

About Salt Lake City there is of course much to interest the entomologist. The electric line up Emigrant Canyon gives a ride up to about 7000 feet altitude for 80 cents, and should never be overlooked by collectors who visit the city in summer. Near the end of the line, high up in the mountains, I captured *Dolichopus n. sp.*, *Tachytrechus n. sp.* and *Hydrophorus philombrius*. The shores of Great Salt Lake are easily accessible by going to Saltair or by taking the local trains which run out to Garfield and Smelter station next beyond. The local train turns round on a Y just beyond Smelter, and from this it is only a short distance to the shore of the lake. There is some brackish water in spots between, around which I collected, but the shore of the lake is a particularly rich field. *Ephydra gracilis* occurs by millions, the larva living in the water; *Ephydra hians* is also numerous in places on the shores, and likewise lives in the water in the larval stage. *Caenia bisetosa* occurs abundantly along the edge of the water, but its larva has not been found. The brackish water back from the lake has along its edges a beautiful new species of *Tachytrechus*.

I stopped off from morning until 5 P. M. at Promontory Point, almost in the middle of the lake, where I found essentially the same beach fauna as near Salt Lake City, adding *Rhicroessa coronata*. The wife of the station agent kindly provided me with dinner, as there is no hotel. The same afternoon I continued across the lake to Lakeside on the west shore, where again the beach fauna is about the same. It is a sidetrack with a few railroad employees, the surrounding country an absolute desert. The main divide between the ancient lake basin of Utah and that of Nevada is a little east of Wells, Nevada, which was the point I selected for my next stop, having been informed that it was on the bank of a river. I had to inquire in the town, after a vain search, whether there was any water near, and was informed that there was a little seepage about a mile below town. It was 2 P. M.

when I got off the train, and I had already lost an hour, so I made what haste I could in the hot sun to the place indicated, where I found in a small space more new and interesting *Diptera* than I ever collected in the same time before. Within two hours the following and many more common species were obtained: *Anacampta latiuscula* and two new species; *Dolichopus ciliatus*, *amnicola*, *obcordatus* and five undescribed species; *Sphegina n. sp.*, *Euparyphus n. sp.*, *Asyndetus n. sp.*, *Calobata pallipes*, *Palloptera jucunda*, *Diaphorus palpiger* and *opacus*, *Hydrophorus sodalis* and *magdalенаe*, *Lispa tentaculata* and *uliginosa*, and some not yet fully determined. In accordance with my plans, I continued my journey at ten that evening, but there are some very attractive-looking high mountains a few miles south of Wells that had timber and snow upon them, which would in my opinion be one of the best collecting fields in the West.

Hazen, Nevada, was reached the next morning. A good hotel is the principal feature of the place, which consists principally of a few railroad employees. The Soda Lakes are about ten miles south, being some two miles from Mirage siding, on the Fallons branch. They are small bodies of very alkaline water, where quite a business was done in the manufacture of soda until the seepage from the new irrigating canals of the Truckee-Carson government irrigation project raised the level above the evaporating beds and put a stop to the enterprise. I stayed over night with the caretaker at the works and collected at the shore of the lakes *Ephydra hians* and *Caenia bisetosa*, as at Great Salt Lake. A single male of *Hydrophorus plumbeus* Ald. was found also, known previously only from a single female from Soap Lake, Washington. Around fresh or brackish seepage I found another new species of *Dolichopus*, *Hydrophorus aestuum* and *gratiosus*, *Pelastoneurus cyaneus*, *Thrypticus fraterculus*, and *Melieria occidentalis*. *Chrysops discalis* was occasionally present.

On July 14 I made a visit to Reno and called upon Professor S. B. Doten, whom I found much engrossed with his interesting investigation of the habits of Hymenopterous parasites, for which he has invented several ingenious pieces of apparatus; his devices for instantaneous photography under

the microscope are especially worthy of commendation. A short stroll around the outskirts of the town yielded *Thrypticus fraterculus*, *Chrysomya demandata*, *Asemosyrphus mexicanus*, *Madiza (Desmometopa) halteralis* and some commoner things.

The next day I returned eastward to Wadsworth and took the stage 20 miles north to the Nevada Indian School, where the superintendent, Mr. J. D. Oliver, provided me with accommodations and I remained four days. The trip in was highly interesting to me, as I discovered a really garrulous Indian in the driver "Fat Joe," and we struck up a warm friendship. The school is four miles from Pyramid Lake and eight from Winnemucca Lake, both of which I visited. They are moderately alkaline, but contain large quantities of fish. There is a more alkaline pond a mile south of Pyramid Lake, but it was difficult to reach, as it was on the other side of the Truckee River and the water was high; so I did not visit it. The bottoms of the Truckee River are verdant in this desert region and offer some good insects. The shore of Pyramid yielded a few *Lisps* of an undescribed species, as well as *Ephydra hians*; at Winnemucca I found still another undescribed *Lispa* with several common species of the genus. Among the Diptera collected on my trips to and from the lakes and about the Indian school were *Chrysops discalis* and *coloradensis*, *Tabanus opacus*, *Exoprosopa eremita*, *Anthrax agrippina*, *nugator*, *lepidota*, *Ceria tridens*, *Tachytrechus angustipennis*, *Thrypticus fraterculus*, *Hydrophorus graciosus* and *philombrius*, *Geomyza frontalis*, *Rhinoessa albula*, *Urelia abstersa* and *Caenia bisetosa*.

On July 19 I returned to Wadsworth and took the train to Hazen, where I took the Goldfield train next morning to the little freighting station of Thorne, close to the south end of Walker Lake. An automobile conveys the passengers seven miles across a very sandy desert to the county seat town of Hawthorne, occupying a little oasis less than half a mile square. After dinner another auto stage runs before supper-time to Bodie, California, climbing over the Walker Lake mountain range, crossing a valley and ascending almost exactly to the summit of the next range, Bodie having an ele-

vation of 8400 feet. The road was good and our speedometer indicated 35 miles an hour on one down grade stretch, with seven passengers and a heavy load of mail, express and baggage. Bodie is an old, decayed mining camp with a few hundred inhabitants. Next morning a horse stage driven by a Mexican took me to one of my main objective points, Mono Lake, a distance of 22 miles. I stopped at the Mono Lake post-office and secured accommodations for a few days at the combined store, saloon, hotel, blacksmith shop and feed mill of Jack Hammond, about a mile beyond. Here I devoted my first attention to the insects of the lake itself. It is a highly alkaline body of water and contains vast numbers of the larvae of *Ephydra hians*, used in the pupa stage as food by the Indians under the name of "koo-tsabe." The specific identity of the fly had not been ascertained prior to my visit. Along the west side of the lake the shores rise abruptly into the Sierras, and there are numbers of rapid streams, large and small. The collecting is superb, and I could have spent more time to good advantage, but my plans limited me to four days. Besides some new species, the following are the more interesting results of my collecting: *Bittacomorpha sackeni*, *Tabanus opacus* and *phaenops*, *Thereva johnsoni*, *Tachytrechus olympiae* and *angustipennis*, *Nothosympycnus vegetus*, *Psilopodinus pilicornis*, *Sympycnus marcidus*, *Chrysogaster nigrovittata*, *Clausicella setigera*, *Notonaulax cincta* and *Themira putris*.

Mono Lake lies close against the east side of the main Sierras, directly east of Yosemite Park, which comes up to the divide, about 16 miles by trail from the lake. Parties not infrequently come down to the lake from the Park; in fact it is more visited from that side than from the railroad some 65 miles away to the eastward. When I was there the Sierras towering above it were covered with great fields of snow and I never saw a more picturesque view than the one looking down on the lake and across it to the mountains, from the range near Bodie.

On my return to the railroad I had to stay over night at Thorne, in order to have time to box up some freight for shipment. The hotel business mostly goes to Hawthorne, but I felt well repaid for any little inconvenience of my stay in

Thorne in making the acquaintance of "Doc" Stewart, mine host at the Old Crow,—an old-timer of the sixties, whose warm-hearted interest in me is a pleasant memory.

From Thorne I continued my journey to Southern California by an unusual route, as it was necessary to include Owen's Lake in the itinerary. I continued down the Goldfield railroad to Mina, where I changed to a narrow-gauge line that ends at Keeler, on the east side of Owen's Lake. I left this line at Owenyo, where it is joined by a Southern Pacific broad gauge branch that strikes the main line at Mojave, from which it is easy to reach Los Angeles.

We reached Owenyo about midnight, several hours behind time, and were accommodated in a box car hotel, the single men occupying hard bunks in an undivided car. Next morning the mixed train on the branch took me as far down as Olancha, which I had been informed would be a good point from which to inspect the west shore of the lake. It proved to be about five miles beyond the lake, so I put in most of the day collecting along a beautiful little mountain stream coming out of the Sierras and around some seepage near the lake. Diptera of interest were *Pelastoneurus dissimilipes*, *Tachytrechus auratus* and *Rhagoletis minuta*. Many insects of other orders occupied my attention and would be well worth recording if they had been identified. That evening I took the up train again to get to a point near the lake, and (accepting advice again) stopped off at Brier siding at 10 P. M., only to find that the ranch supposed to be there was at another siding and there was not a human being within miles except the Mexican boy who had driven down from the Los Angeles aqueduct camp to pick up any Slavs who might have drifted in to work on the ditch. The boy took me up to the camp and let me sleep on a few sacks on the ground. Next morning I secured breakfast with the laborers and walked to the lake, where I made what observations were necessary in time to leave again on the southbound train. The lake is densely alkaline and is full of the larvae of *Ephydra hians*.

The evening of this day found me in Los Angeles and the remainder of the trip may be passed over in a few paragraphs. In Los Angeles I collected carefully about the ponds of crude

petroleum in the oil well district for *Psilopa petrolei*; although I could not find the larva in the petroleum, I succeeded in getting the adults on grass around the pools. In the same locality was *Pelastoneurus dissimilipes*.

On the beach at Santa Monica were many specimens of a new species of *Stichopogon*, and on the surface of a brackish pool close to the beach was a swarm of *Ephydra millbrae*.

On the beach at Long Beach *Lipochaeta slossonae* was abundant.

At Lake Elsinore, an alkaline lake south of Riverside, I captured the same beautiful new species of *Tachytrechus* that I got at the south end of Great Salt Lake; also a single specimen of a new species of *Lispa*, of which I later secured a pair at fresh water at Lewiston, Idaho. *Cacnia bisetosa* was the most abundant insect at the shore.

On the salt marsh adjacent to Palo Alto I collected several specimens of a species of *Canace*, a very peculiar sort of Ephydrid; also *Hercostomus metatarsalis*, *Pelastoneurus cyaneus* and *Hydrophorus aestuum*.

A two days' trip of a strenuous sort was made to Clear Lake, Lake County, Cal., from San Francisco, to ascertain what sort of *Ephydra* it was of which the larva had been named *E. californica* by Packard many years ago. As the lake is fresh water, and not salt as Packard had been informed, it was evident that the larvae came from some other water. I found that two borax ponds near the lake were well known, and made a visit to one of these, where I speedily found *E. hians*, which seemed to settle the identity of Packard's species. I also found the same large, undescribed *Lispa* which accompanied *hians* on the shores of Great Salt Lake.

The papers which I have published on the results of the trip are the following:

1. Larvae of a Saturniid Moth Used as Food by California Indians. Jour. N. Y. Ent. Soc., xx, 1-4, 1 pl.; Mar., 1912.
2. Flies of the Leptid Genus *Atherix* Used as Food by California Indians. Ent. News, xxiii, 159-163; Apr., 1912.
3. The Biology of Some Western Species of the Dipterous Genus *Ephydra*. Jour. N. Y. Ent. Soc., xx, 77-99, 3 pl.; June, 1912.
4. Two Western Species of *Ephydra*. Ibid., 100-103; June, 1912.
5. The North American Species of the Dipterous Genus *Lispa*. Jour. N. Y. Ent. Soc., in press.

The Appearance of an Unexpected Noctuid on the Atlantic Seaboard (Lepid.)

By H. BIRD, Rye, New York.

In 1881 Grote described a western Noctuid, now classed an *Apamea*, as *Gortyna erepta*, his unique type being captured by Prof. F. Snow, in Douglas County, Kansas. This type found its way to the British Museum and the species seems not to have been met with since. Some years ago, during the lifetime of Prof. Snow, the writer corresponded with him in hopes of securing other examples from that locality, but while the professor remembered the insect very well, he had never learned of its capture again. Little were we aware that a fine colony was flourishing within ten minutes' walk of my door.

One of the largest grasses found at Rye is *Tripsacum dactyloides* L., and its occurrence seems confined to a few locations where the margin of upland and salt meadow meet, and is here subjected to inundation by the extreme high tides that occur at intervals. This strip of vegetation, rarely but a few feet wide, exemplifies a remnant of primitive flora which it is hard to duplicate elsewhere. The salty conditions render it unfit for cultivation, and it is allowed to remain waste, a sample of our only local, pre-Columbian, upland flora. It seems evident that *Tripsacum* obtains here due to this undisturbed condition, rather than that it likes a salty environment, since it follows the Upper Austral zone, south and westward, more than half across the country. A search of the grasses had been going on for some years to apprehend the larva of *Apamea americana* Speyer, or *A. nictitans* L., as some choose to consider it, reported to bore "grasses" by certain American writers. This is a generalized statement apparently and seems based on reports from European sources that there the *nictitans* forms have such a food habit. While many grasses, and *Tripsacum* in particular, had been under observation before, it was not till 1911 that a likely borer was found working in the latter, a form showing *Apamea* or *Hydroecia* characteristics, and supposed at the time of its discovery to be *americana* without doubt. It so happened on this occasion a

very high tide covered the meadows, and as we stood in water to our shoe tops while digging out a root containing several larvae, we were forced to conclude that the term "*atlantica*" as applied to our alleged insect by Prof. J. B. Smith, when he separated our forms on genitalic characters, was well chosen. If one might stand in the Atlantic Ocean and pluck its larva, surely it was aptly named. In due course, however, the moths appear, but instead of an Atlantic coast form we find the only insect with which it tallies is the Kansan *erepta*. Specimens were kindly compared by Sir G. F. Hampson with the British Museum type, and he reports they differ only in minor detail. While it may be hard to reconcile the habitats, as *Tripsacum* occurs in Kansas we may assume *erepta* feeds on it there, though it may be doubtful if a chain of the plants now exists across the country that the species could yet enjoy an uninterrupted range. Believing the local colonies are a stable variety of the type form, the varietal name *ryensis* is proposed for it.

***Apamea erepta ryensis*, new variety.**

Head smooth in front, antenna of male finely ciliated, thoracic tuftings normal. The ground color is straw yellow, occasionally becoming more deeply ochreous in the primaries, powderings of wine-red or brownish scales are more or less diffused thereon and frequently interspersed with some black scales, the quantity of powderings producing some variation. Basal line vague, antemedial line irregularly



Male genitalia of *Apamea erepta ryensis*.

waved, transverse line rounded outward past reniform; these lines simple and defined in brown, subterminal line vague, a finely penciled black line at base of fringes; claviform wanting; orbicular usually wanting, rarely a vague ring; reniform a pure white lunule or angulated crescent in a black setting. Secondaries show ground color more or less diffused with black, the discal lunule and mesial line drawn in black powderings. The female is usually lighter due to less of the overlaid powderings.

Expanse, 34-35 mm.; size very constant.

Genitalia of male are of a unique pattern, departing materially from the *nictitans* group, and are best understood by a reference to the figure.

Type locality.—Milton Point section of Rye, inception of Forest and Stuyvesant Avenues, N. 85 deg., E. 302.5 meters; West Chester County, N. Y., U. S. A.

Forty bred specimens are at hand. A male type is so labeled in author's collection, and paratypes have been forwarded to the U. S. National and the British Museums.

The variety differs chiefly in the absence of a well-indicated orbicular. Knowing the value of genitalic comparisons in the closely allied species, where the differences of the imagoes are slight, we feel there may be further departures from these characters of the type form.

The work of the larva is easily overlooked. *Tripsacum* sends up such a mass of culms that those dwarfed by the borers are soon overtopped by the normal growth. The young larvae, having hatched out about the first week in May, work down in the tender center of the culms, when they have grown but a few inches. The individual culms arise from hard nodules, or corms, arranged in a great spreading root-clump, and the boring is confined to the base, though never entering the corm. The dwarfed stem that arises does not develop a flowering spike, and the burrow is but a few inches in length. At first the frass is thrown out, later the gallery becomes rather clogged with it. The larva seems always tightly jammed in the boring, for the rapidly growing leaves enfold it in an ever tightening envelope. As the leaves conduct moisture down to their bases, these galleries get in a very unwholesome condition, and become congenial haunts for several dipterous species. Two of these are species of *Drosophila* apparently,

that find the fermenting frass a proper environment, another appears to be a Trypetid whose larva keeps among the frayed and broken leaf tissues. This same fly has been noted associated with *Papaipema nebris*, when the latter was boring corn. No parasites have been detected. The winter is passed in the egg stage without doubt, though this and the first larval stages were unobserved, and the species is single-brooded. The larvae were first met May 10, and the following stages observed:

Stage IV ? Head small, rounded, pale yellow, a dark spot at ocelli. Thoracic joints small compared to middle, as is anal extremity; sutures deep; color is whitish translucent, each segment except the first and twelfth showing a contrasting ring or girdle of purple brown on the anterior half, giving a peculiar and characteristic ringed appearance. The cervical shield is wider than the head, the anterior edge marked heavily and the posterior, rounded portion, penciled lightly in black; tubercles normal, do not show clearly on the dark rings, similar through last four stages; setae well developed for a borer; legs sixteen.

Stage I ? No change.

Penultimate stage. The purple rings not so dark, otherwise no change.

Last stage. Color of rings fades perceptibly, and are lost ventrally; tubercles not large, black; on joint two Xa and Xb seem defined in a small dark area but are without setae; Ia, Ib, IIa and IIb small but bear stiff setae, IV is largest, the size of a spiracle; on joint ten IV is very low down, and on eleven I and II enlarge, III and IIIa are separate, and on twelve I and II are fused, III, IV and V appear separated, all closely preceding the anal shield; leg-plates prominent and facing a little anteriorly; crochets on prolegs on joint nine number fourteen.

Length for the four stages: 14, 22, 28, 34 mm. respectively.

The pupal change does not occur in the gallery, but under a slight depth of soil. The pupa is very active, of brown color, surface shining, no frontal development, cremaster two sharp straight spurs.

Pupation occurs June 8-14, the moths emerge June 28 to July 6.

Comparing these larvae with the allied genera *Hydroecia* and *Papaipema*, they come closer to the former in their peculiar ringed coloration, which finds duplication in the similar larval pattern of *H. immanis* and *micacea*.

There is little doubt that this colony of *ryensis* has flourished many years at its present station. Both they and their

food plants possess certain features that may make for longevity and a vigorous line of descent. While the moths emerge in a short interval, there is a noteworthy appearance of males first; further these males are exceedingly active. Even in day time it is hard to raise the lid of a breeding box without some escaping, while at night they very soon spoil their wings. The tendency of such borers to form isolated colonies involves the likelihood of inbreeding to some degree. As working against this, the earlier appearance of the males indicates there may be some dispersal of them to seek mates afar. Their activity and strength of flight would permit of it.

With the food plant there is surely a pronounced effort to avoid self-fertilization at the time it blooms, its unisexual spikelets striving to co-operate with those of another flower. Here we see the staminate portion blooming sooner than the pistillate, on the same stemmed rachis, and there is so much difference that chance of self-fertilization is rather remote. Their great clustered root stocks show in part a perennial record of the culms born, and many of the plants in the type locality have surely been established for half a century. Thus we seem to have a plant and an insect admirably associated, and a knowledge of the food habit will, we predict, bring the species to light from many other quarters.

Use of Ants in Punishments (Hymen.).

In British Guiana the natives make what are termed "ant mats," which are employed in certain ordeals, and as punishments for youngsters, especially of the female sex. Certain varieties of "biting" ant are stuck into the smaller interstices of the mat, where they are held in place by the stretching upon the handles of the mat, which is then pressed as a whole upon the forehead, breast, or stomach. (*Jour. Roy. Anthropol. Inst.*, July-Dec., 1912.)

To Collect Lepidopterous Pupae.

In the spring thousands of young trees are sold by nurseries and are dug for shipment and many lepidopterous pupae are unearthed. This should prove a fruitful source of supply for the collector and give opportunity to rear many rare and beautiful specimens. Workmen in nurseries would doubtless be very glad to save pupae for those interested, especially if some slight compensation were offered.—
HENRY SKINNER.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., MAY, 1913.

Mr. S. A. Rohwer, Corresponding Secretary of the Entomological Society of Washington, has recently written us that "on April 3rd, Dr. David Sharp, Lawnside, Brockenhurst, Hants, England, and Dr. J. H. Fabre, Serignan, Vaucluse, France, were chosen as the first two honorary members of the Entomological Society of Washington. The Entomological Society of Washington has ten honorary members to be chosen only from among foreign entomologists."

We are glad to learn that the Entomological Society of Washington has provided for foreign honorary members and the choice which has been made for the first two places in the list is highly to be commended. Very diverse opinions have been expressed on the honor attaching to such membership in societies in general but, when all has been said, it is a pleasant thing for one who has labored long and well in our chosen science to read his own name in a brief list of those deemed worthy of special mention by his collaborators. Entomology is no national property, but is international in its scope and in its endeavor. It will prosper as international co-operation increases, and one of the ways by which this co-operation is furthered is just that way which the Washington Society is instituting.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Macrobrachius in America (Dipt.)

This genus was erected by Dr. H. Dziedzicki, in 1889, for the Mycetophilid, *M. kowarzii* n. sp. from eastern Europe. In Bulletin No. 200, Maine Agricultural Experiment Station, p. 60, I described, under the name *Phronia producta*, a fly taken at Brookline, Mass., which should have been placed in *Macrobrachius*. By some mischance I overlooked the genus, although three years previously I had correctly placed it in the dichotomic table in Genera Insectorum, Fasc. 93, page 57, last line. In the key of the last mentioned paper there are two entries of the genus, the first of which (page 56, seventh line from the bottom) should be stricken out, as an examination shows that the ocelli are placed as in *Phronia*.—O. A. JOHANSEN, Cornell University, Ithaca, New York.

Pacific Slope Association of Economic Entomologists.

The following program was announced for the fourth annual meeting of this Association, at the University of California, Berkeley, Cal., on Thursday, Friday and Saturday, April 10-12, 1913, in affiliation with the Pacific Association of Scientific Societies:

Thursday afternoon, April 10. "Notes on Entomological Literature and Events of 1912," Professor R. W. Doane, Leland Stanford University. "Internal Anatomy and Development of *Epidiaspis piri-cola*," Mr. LeRoy Childs, Leland Stanford University. "A new method of automatic dehydration," Mr. George A. Coleman, University of California. "A preliminary list of the Coleoptera that have been introduced into California," Dr. Edwin C. Van Dyke, University of California. "The Sensory Reactions of housefly larvae with special reference to light, heat and moisture," Mr. R. J. Jungerman, University of California.

Thursday evening, April 10. Meeting of the Pacific Coast Entomological Society under the Presidency of Dr. Edwin C. Van Dyke.

Friday, April 11. "Sesian borers of strawberries, blackberries and currants in the Santa Clara Valley," Mr. Verne G. Stevens, Leland Stanford University. "Raisin Insects," Mr. L. J. Nickels, University of California. "A Resumé of Aphid Economics," Professor J. C. Bridwell, University of California. "Our Quarantine Service," Professor A. J. Cook, State Commissioner of Horticulture. "The relation of sensory reactions to the assembling habits of *Hippodamia convergens*," Miss Martha S. Beaser, University of California. "Im-

portation of Beneficial Insects," Professor A. J. Cook. "Insecticide Co-efficients," Professor C. W. Woodworth, University of California. "Flour paste as a control for Red Spiders and as a spreader for contact insecticides," Mr. W. B. Parker, U. S. Dept. of Agriculture. "Fumigation Injury to Oranges," Professor C. W. Woodworth. "The Progress made in the use of Miscible Oils in California," Mr. R. R. Rogers, K. R. Rogers Chemical Co.

Friday evening, April 11. Dinner and Round Table.

Saturday morning, April 12. "Cockroaches as carriers of infection," Mr. Y. Nelson, University of California. "Notes on Diptera reared from cow manure," Mr. W. L. Smith, Leland Stanford University. "Some observations on *Stomoxys calcitrans*," Mr. H. F. Gray, University of California. "Some special problems of External Parasitization," Professor Vernon L. Kellogg, Leland Stanford University. "The present status of knowledge respecting the *Stomoxys* fly and its relation to Poliomyelitis," Professor W. B. Herms, University of California. "A study of the prevalence of malaria in California by counties covering a period of four years," Professor W. B. Herms. "An experimental study of insecticides as applied to fly larvae," Miss Laura Cairns, University of California.

Saturday afternoon, April 12. Business meeting.

Saturday evening, April 12. Pacific Association of Scientific Societies.

W. B. HERMS, *Secretary-Treasurer*.

Society for the Advancement of Forest Entomology in America.

An organization, to be known as the "Society for the Advancement of Forest Entomology in America," was effected at a meeting held at Washington, D. C., on March 1, 1913, with A. D. Hopkins, T. E. Snyder, S. A. Rohwer, F. C. Craighead, C. T. Greene, and W. S. Fisher, of Washington, D. C., H. E. Burke and J. M. Miller, of Placerville, California, Josef Brunner, of Missoula, Montana, and W. D. Edmonston, of Ashland, Oregon, as charter members.

The object of this Society is to promote a more general interest in the subject of forest entomology and the protection of forest resources from avoidable waste due to the depredations of insects.

Membership is open to persons who manifest an interest in the subject of insects in their relation to the forest resources and the forest products of North America, provided that they are recommended by a member or a responsible person, and the initiation fee of fifty cents and the annual dues of fifty cents are paid to the Secretary-Treasurer.

The following officers were elected: President, A. D. Hopkins; Vice President, H. E. Burke; Recording Secretary, T. E. Snyder; Corresponding Secretary-Treasurer, F. C. Craighead.

Annual meetings will be held at which the economic side of forest

Notes and News.

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Pacific Slope Association of Economic Entomologists.

The following program was announced for the fourth annual meeting of this Association, at the University of California, Berkeley, Cal., on Thursday, Friday and Saturday, April 10-12, 1913, in affiliation with the Pacific Association of Scientific Societies:

Thursday afternoon, April 10. "Notes on Entomological Literature and Events of 1912," Professor R. W. Doane, Leland Stanford University. "Internal Anatomy and Development of *Epidiaspis piri-cola*," Mr. LeRoy Childs, Leland Stanford University. "A new method of automatic dehydration," Mr. George A. Coleman, University of California. "A preliminary list of the Coleoptera that have been introduced into California," Dr. Edwin C. Van Dyke, University of California. "The Sensory Reactions of housefly larvae with special reference to light, heat and moisture," Mr. R. J. Jungerman, University of California.

Thursday evening, April 10. Meeting of the Pacific Coast Entomological Society under the Presidency of Dr. Edwin C. Van Dyke.

Friday, April 11. "Sesian borers of strawberries, blackberries and currants in the Santa Clara Valley," Mr. Verne G. Stevens, Leland Stanford University. "Raisin Insects," Mr. L. J. Nickels, University of California. "A Resumé of Aphid Economics," Professor J. C. Bridwell, University of California. "Our Quarantine Service," Professor A. J. Cook, State Commissioner of Horticulture. "The relation of sensory reactions to the assembling habits of *Hippodamia convergens*," Miss Martha S. Beaser, University of California. "Im-

portation of Beneficial Insects," Professor A. J. Cook. "Insecticide Co-efficients," Professor C. W. Woodworth, University of California. "Flour paste as a control for Red Spiders and as a spreader for contact insecticides," Mr. W. B. Parker, U. S. Dept. of Agriculture. "Fumigation Injury to Oranges," Professor C. W. Woodworth. "The Progress made in the use of Miscible Oils in California," Mr. R. R. Rogers, K. R. Rogers Chemical Co.

Friday evening, April 11. Dinner and Round Table.

Saturday morning, April 12. "Cockroaches as carriers of infection," Mr. Y. Nelson, University of California. "Notes on Diptera reared from cow manure," Mr. W. L. Smith, Leland Stanford University. "Some observations on *Stomoxys calcitrans*," Mr. H. F. Gray, University of California. "Some special problems of External Parasitization," Professor Vernon L. Kellogg, Leland Stanford University. "The present status of knowledge respecting the *Stomoxys* fly and its relation to Poliomyelitis," Professor W. B. Herms, University of California. "A study of the prevalence of malaria in California by counties covering a period of four years," Professor W. B. Herms. "An experimental study of insecticides as applied to fly larvae," Miss Laura Cairns, University of California.

Saturday afternoon, April 12. Business meeting.

Saturday evening, April 12. Pacific Association of Scientific Societies.

W. B. HERMS, *Secretary-Treasurer*.

Society for the Advancement of Forest Entomology in America.

An organization, to be known as the "Society for the Advancement of Forest Entomology in America," was effected at a meeting held at Washington, D. C., on March 1, 1913, with A. D. Hopkins, T. E. Snyder, S. A. Rohwer, F. C. Craighead, C. T. Greene, and W. S. Fisher, of Washington, D. C., H. E. Burke and J. M. Miller, of Placerville, California, Josef Brunner, of Missoula, Montana, and W. D. Edmonston, of Ashland, Oregon, as charter members.

The object of this Society is to promote a more general interest in the subject of forest entomology and the protection of forest resources from avoidable waste due to the depredations of insects.

Membership is open to persons who manifest an interest in the subject of insects in their relation to the forest resources and the forest products of North America, provided that they are recommended by a member or a responsible person, and the initiation fee of fifty cents and the annual dues of fifty cents are paid to the Secretary-Treasurer.

The following officers were elected: President, A. D. Hopkins; Vice President, H. E. Burke; Recording Secretary, T. E. Snyder; Corresponding Secretary-Treasurer, F. C. Craighead.

Annual meetings will be held at which the economic side of forest

entomology will be discussed, including the reading of papers on the conservation of forest resources. It is intended to publish Proceedings when the Society becomes established on a sufficiently extensive basis. In the meantime, papers and discussions of general interest will be presented for publication to forestry, entomological and timber journals.

Persons interested in this movement should correspond with Mr. F. C. Craighead, Corresponding Secretary-Treasurer, Room 410, Evening Star Building, Washington, D. C.

Notes on *Lycaena amyntula*, *monica* and *tejua* (Lep.).

I was interested in what Mr. Bethune-Baker said in the last issue of this journal, in relation to *amyntula* being single-brooded, with possibly a partial second brood. There seems to be a lack of data in regard to the species and I thought it would prove of interest to publish the data on the specimens in the collection of the Academy of Natural Sciences of Philadelphia, where the specimens had more than State labels on the pins. Los Angeles, California, April 18; Cochise County, Arizona, May (Huachuca Mountains?); Olympia, Washington, May; Golden, Colorado, May 24th; Stockton, Utah, May 31st; Fort Klamath, Oregon, June 10, 17, 21; Priest River, Idaho, June 21st; City Creek Canyon, Salt Lake City, Utah, July 5th; Silver Lake, Utah, July 15, 18th. These are all bright, fresh specimens and those mentioned from City Creek Canyon and Silver Lake were taken by myself. It would appear from these records that there may be a second brood in July. It should also be remembered, however, that the late records are in places where it is relatively cold and at considerable elevations in the mountains, Silver Lake being at 10,000 feet altitude. I have seen ice in the lakes and streams there in July. Now that it is the custom to put date of capture on specimens it will be easier to work out these interesting problems.

I look upon an examination of the genitalia as a valuable aid in the identification and separation of species. After such examination and differentiation is made, the student should be able to give satisfactory secondary characters to separate the forms or species. It is too much, to ask those interested, to make mounts of the genitalia of all their specimens to identify them. Mr. Bethune-Baker would confer a favor by giving absolute characters to separate *amyntula* and *comyntas* other than genitalic.

He evidently received some of his references second-hand. *Lycaena tejua* Reakirt is a synonym of *Hesperia strabo* Fabricius, and *Lycaena monica* Reakirt is a synonym of *Hesperia cnejus* Fabricius.

The types are in the Strecker collection, now in the Field Museum, Chicago, Illinois. "Reakirt received at various times considerable ma-

terial from Lorquin, Jr., a dealer in San Francisco, who sent him indiscriminately examples from the Philippines, California and Europe not accurately ticketed as to locality, hence such mistakes as the above, as the real home of *tejua*, which is only a synonym of *strabo* was somewhere in the Philippines or the Dutch East Indies." The remarks preceding apply equally to *monica* and *cnejus*. See Strecker, Lep. Rhop. Het. suppl. No. 3, p. 20.—HENRY SKINNER.

International Exposition of Ornithology, Entomology and Botany.

[An "Exposition Internationale documentaire d'Ornithologie, d'Entomologie et de Botanique dans leur rapports avec l'Ornithologie" has been organized by three of the Ornithological Societies of Belgium. We have received the following statement in regard to it.]

We have the honour to send you a program of our approaching exhibition which will take place from May 3rd, to June 1st, 1913, on the premises of the "Palais des Beaux-Arts" in the town of Liege. This exhibition is of quite a new kind, and believe we can certify that it will prove a great success, considering the adhesions which have already been promised us up to the present.

We should be very glad if you would take part in it by sending collections. As you will observe our field is pretty large and collections of birds, insects, plants, different books, etc., will find a place in it. Knowing all the value that amateurs attach, and rightly, to their collections which are sometimes very fragile, we can assure you they will be the object of the greatest care on our part. Besides a vigorous watch, being kept day and night in the exhibition, we have considered it wise to assure against the risk of fire.

We draw the attention of possible exhibitors to the fact that what they send will be admitted in transit and that every facility for sale will be eventually reserved to them. Finally, it is incontestable that professionals and dealers have every advantage in putting themselves before the public by means of an advertisement in our catalogue which will be published on the occasion of this exhibition. This is a novelty in Europe and will contribute to the union of amateurs and professionals.

We beg to remain, sir, for the Committee, the General Commissary,
L. CUISINIER, a Ans, rue de Bruxelles 155 (Belgique.)

[The Exposition is stated to have the encouragement of the King and the patronage of the Queen of the Belgians; the Honorary Committee comprises the Minister of Agriculture and Public Works, the Minister of Sciences and Arts, the Governor of the Province and the Mayor of the City of Liege and the Mayor of Verviers, and among other members we note the names of the entomologists MM. Baron Crombrughe de Picquendaale and G. Severin.]

On the Humming of Chironomidae (Dipt.).

Mr. E. E. Green, of Peradeniya, Ceylon, in the *Entomologists' Monthly Magazine* for February, 1913, gives an account of his experience with *Chironomus ceylanicus* Kieffer, of which the following is an abstract:

"Colombo, Ceylon, is plagued at certain seasons by dense swarms of so-called 'lake-flies,' which issue at night-fall from the margins of the shallow lake that spreads its many arms through the residential quarters of the town. . . . Bungalows situated on the leeward side of the water are rendered almost uninhabitable during the fly season, when the insects swarm into the lighted rooms, blackening the walls . . . and making themselves generally objectionable. In the morning they may be swept up literally by the bushel.

I happened to be bicycling one evening along a road that impinged—at one point—upon an arm of the lake. On approaching this spot I became aware of a gradually increasing and insistent noise . . . when I suddenly was involved in a dense fog of flying insects. I was instantly smothered in the flies which filled my eyes, ears and nose, almost blinding and suffocating me. . . . The noise which, at the time, I supposed to be produced by the vibration of the myriad wings, was most extraordinary. I now understand that it is more probably attributable to actual stridulation."

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues, which are generally dated the year previous.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

2—Transactions, American Entomological Society, Philadelphia.
4—The Canadian Entomologist. 5—Psyche. 7—U. S. Department of Agriculture, Bureau of Entomology. 8—The Entomologist's Monthly Magazine, London. 9—The Entomologist, London. 11—Annals and Magazine of Natural History, London. 21—The Entomologist's Record, London. 22—Zoologischer Anzeiger, Leipzig. 38—Wiener Entomologische Zeitung. 49—Annales historico-naturales Musei Nationalis Hungarici, Budapest. 50—Proceedings of

the U. S. National Museum. **59**—Sitzungsberichte, Gesellschaft der naturforschenden Freunde, Berlin. **75**—Annual Report, Entomological Society of Ontario, Toronto. **79**—La Nature, Paris. **87**—Bulletin, Societe Entomologique de France, Paris. **92**—Zeitschrift fur wissenschaftliche Insektenbiologie. **99**—Cornell University Agricultural Experiment Station, Ithaca. **104**—Mittheilungen, Naturhistorisches Museum in Hamburg. **148**—New York Agricultural Experiment Station, Geneva. **153**—Bulletin, American Museum of Natural History, New York. **160**—Internationale Revue der Gesamten Hydrobiologie und Hydrographie, Leipzig. **166**—Internationale Entomologische Zeitschrift, Guben. **169**—"Redia," R. Stazione di entomologia Agraria in Firenze. **175**—Aus der Natur, Berlin. **176**—Archiv fur entwicklungsmechanik der Organismen, Leipzig. **179**—Journal of Economic Entomology. **182**—Revue Russe d'Entomologie, St. Petersburg. **191**—Natur, Munchen. **194**—Genera Insectorum. Diriges par P. Wytzman, Bruxelles. **198**—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. **216**—Entomologische Zeitschrift, Frankfurt a. M. **281**—Annals of Tropical Medicine and Parasitology, University of Liverpool, Series T. M. **320**—Der Tropenpflanzer, Berlin. **322**—Journal of Morphology, Philadelphia. **337**—Meddelelser om Gronland. Denmark Ekspeditionen til Gronlands Nordostkyst 1906-08, Copenhagen. **351**—Zeitschrift fur Allgemeine Physiologie. Herausgegeben von Max Verworn, Jena. **368**—The Monthly Bulletin of the State Commission of Horticulture, Sacramento, Cal. **369**—Entomologische Mitteilungen, Berlin-Dahlem. **390**—Zoologischer Beobachter, Frankfurt a. Main. **411**—Bulletin of the Brooklyn Entomological Society. **420**—Insecutor Inscitiae Menstruus: A monthly journal of entomology, Washington, D. C. **421**—Report of the State Entomologist on the Noxious and Beneficial Insects of Illinois, Urbana. **422**—Coleopterologische Rundschau, Wien. **423**—Journal of the College of Agriculture, Sapporo, Japan.

GENERAL SUBJECT. **Babak, E.**—Ueber die atmung der insekten, **175**, 1913, 293-98. **Berlese, A.**—Piccolo apparecchio per raccogliere automaticamente i Calcididi parassiti da collezione, **169**, viii, 471-72. Gli insetti Vol. II, fasc. 4-6. Gli affini degli insetti. L'antichita degli insetti, pp. 97-176. **Criddle, N.**—Insect migration at Aweme, Manitoba, **75**, 1911, 74-76. **Curtis, W. P.**—The coloration problem, **21**, 1913, 57-61 (cont.). **Dewitz, J.**—Physiologische untersuchungen bezuglich der verwandlung von insekten-larven, **23**, xli, 385-98. **Essig, E. O.**—Injurious and beneficial insects of California, **368**, ii, 1-351. **Gardner, C. C. B.**—Experiments on the capability of ants to withstand drought and to recover from its effects when nearly dead, **21**, 1913, 81-83. **Gibson, A.**—The entomological record 1911, **75**, 1911, 89-112. **Gibson, A. et al.**—Reports on insects of the

year 1911, **75**, 1911, 9-38, 72-74. **Grandori, R.**—Studi sullo sviluppo larvale dei copepodi pelagici, **169**, viii, 360-457. **Hartman, F. A.**—Variations in the size of chromosomes. Giant germ cells in the grasshopper, **198**, xxiv, 226-244. **Herrick, G. W.**—Some external insect parasites of domestic fowls, **179**, vi, 81-85. **Hewitt, C. G.**—Insect scourges of mankind (abstract), **75**, 1911, 46-50. **Holloway, T. E.**—Field observations on sugar-cane insects in the U. S. in 1912, **7**, Circ. 171. **Kirby, W. F.**—Obituary notice, **166**, vi, 325-26. **Kusnezov, N. J.**—Sur la tendance vers les denominations superflues en entomologie ("die Namengeberei" des auteurs allemands), (Russian), **182**, xii, 256-76. **Lengerken, H. v.**—Etwas ueber den erhaltungszustand von insekteninklusen im Bernstein, **22**, xli, 284-86. **Olsen, C. E.**—The enemies of a plant louse, **411**, viii, 41-42. **Oshannin, W.**—Zur nomenklaturfrage in der zoologischen systematik, **216**, xxvi, 197-200. **Sernichon, L.**—Sur la differentiation chromatique de certains granules de reserve chez des insectes, **87**, 1913, 69. **Sokolar, F.**—Entomologische fundorte, **422**, ii, 46-51. **Walker, E. M.**—Some injurious forest insects at De Grassi Point, Lake Simcoe, **75**, 1911, 55-63. **Woglum, R. S.**—Report of a trip to India and the Orient in search of the natural enemies of the citrus white fly, **7**, Bul. 120. **Zacher, F.**—Notizen ueber schadling tropischer kulturen, **320**, 1913, 131-44.

ARACHNIDA, ETC. **Cooley, R. A.**—Notes on little known habits of.... *Dermacentor venustus*, **179**, vi, 93-95. **Kautzsch, G.**—Studien ueber entwicklungsanomalien bei *Ascaris*, II, **176**, xxxv, 642-691. **Quayle, H. J.**—Some natural enemies of spiders and mites, **179**, vi, 85-88.

Kraepelin, K.—Neue beitrage zur systematik der gliederspinnen, II, **104**, xxix, 45-88. **Tragardh, I.**—Acari (of the Danish expedition to Greenland, 1906-1908), **337**, iii, 417-26.

APTERA AND NEUROPTERA. **Cummings, B. F.**—Apropos of the first maxillae of the genus *Dipseudopsis* (Trichoptera), **11**, xi, 308-12. **Hewitt, C. G.**—Thrips affecting oats, **75**, 1911, 63-65. **Saemann, J.**—Das ausschluflen der libelle, **191**, 1913, 266-68.

Navas, R. P. L.—Nemopteridae (Neuroptera), **194**, fas. 136, 23 pp. **Navas, R. P. L.**—Zur lebensweise der ameisenlowen, **369**, ii, 81-87. **Paine & Mann.**—Mallophaga from Brazilian birds, **5**, 1913, 15-23.

ORTHOPTERA. **Caudell, A. N.**—Locustidae, subfam. *Meconeminae*, *Phyllophorinae*, *Tympanophorinae*, *Phasgoneurinae*, *Phasmodinae*, *Bradyporinae*, *Ephippigerinae*, **194**, fas. 138, 140. **Hartman, F. A.**—(See under General Subjects.)

Bruner, L.—Results of the Yale Peruvian expedition of 1911.—*Acridiidae*, **50**, xlv, 177-87. **Caudell, A. N.**—Results of the Yale

Peruvian expedition of 1911.—O. (exclusive of Acridiidae), **50**, xliv, 347-57. **Chopard, L.**—Description d'un genre nouveau et d'une espece nouvelle de Mantidae de la Republique Argentine, **87**, 1913, 55-60. **Karny, H.**—Locustidae, subfam. Listroscelinae, Conocephalinae, Copiphorinae, Agraeciinae, **194**, fas. 131, 135, 139, 141.

HEMIPTERA. **Blacklock, B.**—On the resistance of "*Cimex lectularius*" to various reagents, powders, liquids and gases, **281**, vi, 415-434. **Hartzell, F. Z.**—The grape leaf-hopper, 148, Bul. 359. **Hewitt, C. G.**—The spring grain aphid or "green bug" (*Toxoptera graminum*), **4**, 1913, 77-80. **Teodoro, G.**—Sulla struttura delle valve anali del "*Lecanium Oleae*," **169**, viii, 458-61. **Wheeler, W. M.**—A giant coccid from Guatemala, **5**, 1913, 31-33.

Distant, W. L.—Homoptera. Cicadidae, subfam. Cicadinae, **194**, fas. 142, 63 pp. **Kirkaldy, (late) G. W.**—Generic tables for the cimicid subfamilies Phyllocephalinae, Phloeinae and Dinidorinae, **4**, 1913, 81-84. **Lallemand, V.**—Homoptera. Cercopidae, **194**, fas. 143, 167 pp.

LEPIDOPTERA. **Burgess, A. F.**—The dispersion of the gipsy moth, **7**, Bul. 119. **Cockerell, O. J.**—Illustrations of American L., **9**, 1913, 73. **Dawson, H.**—Some notes on *Hepialus hyperboreus*, **75**, 1911, 81-82. **Frohawke, F. W.**—Hibernation of *Pyrameis atlanta*, **9**, 1913, 40-42. **Gill, J. B.**—The fruit tree leaf-roller (*Archips argyrospila*), **7**, Bul. 116, pt. 5. **Harwood, W. H.**—Duration in the larva state of *Trochilium apiformis*, **9**, 1913, 58. **Johnson & Hammar.**—The grape-berry moth (*Polychrosis vitaena*), **7**, Bul. 116, pt. 2. **Kleine, R.**—Die kummelmotte *Schistodepressaria nervosa*, **92**, 1913, 37-41 (cont.). Das ei von "*Propylaea 14-punctata*," **166**, vi, 330-31. **Kosminsky, P.**—Zur frage ueber die unbestandigkeit der morphologischen merkmale bei *Abraxas grossulariata* (Russian), **182**, xii, 313-28. **Rau & Rau.**—The fertility of *Cecropia* eggs in relation to the mating period, **198**, xxiv, 245-50. **Rizzi, M.**—Sullo sviluppo dell'uovo di "*Bombyx mori*," **169**, viii, 323-59. **Rothke, M.**—Ein weiteres beispiel des schlupfens von schmetterlingen bei niederer temperatur, **92**, 1913, 1-3. **Rowland-Brown, H.**—Further notes on Hesperid classification, **9**, 1913, 25-28, 109-10. **Schmidt, A.**—Die entwicklungsgeschichte von "*Oxytrypia arbuticola*" (Hungarian), **49**, x, 617-37. **Schuster, W.**—Beitrage zur oekologie und biologie dieser "*Lichtmotte*" (*Eurrhyncha urticae*) wie der *Hydrocampinae* überhaupt, **92**, 1913, 42-44. **Sheldon, W. G.**—A contribution to the life-history of *Brenthis frigga*, **9**, 1913, 80-81. **Tanaka, Y.**—Studies on the structure of the silk glands and the silk formation in *Bombyx mori*, **423**, iv, pt. 2, 1-28, 1911. **Watson, J. H.**—Hewitson's drawings of L., **9**, 1913, 63. **Wood, J. H.**—The wingless geometer, **8**, 1913, 59-61.

Boullet, E.—Description d'une forme femelle de *Baronia brevicornis*, **87**, 1913, 99-101. **Comstock, W. P.**—A new No. American butterfly in the family Lycaenidae, **411**, viii, 33-36. **Dyar, H. G.**—Descriptions of n. spp. of Saturnian moths in the coll. of the U. S. Nat. Museum. Descriptions of new L., chiefly from Mexico, **50**, xliv, 121-134, 279-324. The species of Sphida. The larvae of *Xanthopastis timais*. A note on the Macrothecinae, **420**, 1913, 18, 19, 22-23. **Jordan, K.**—Diagnoses of some American Acraeinae, **9**, 1913, 32-33. **Jorgensen, P.**—Zur kenntnis der Syntomiden Argentinien, **92**, 1913, 3-7 (cont.). **Meyrick, E.**—Heterocera, fam. Adelidae; fam. Micropterygidae, **194**, fasc. 132, 9 pp.; fasc. 133, 12 pp. **Schaus, W.**—New spp. of Erycinidae from Costa Rica, **11**, xi, 298-303. **Swett, L. W.**—Geometrid notes—new varieties, **4**, 1913, 75-76. **Walsingham, L.**—Biologia Centrali-Americana, IV: Heterocera, 169-224.

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Alexander, C. P.—New neotropical Antochini (Tipulidae), **5**, 1913, 40-54. A revision of the So. American dipterous insects of the family Ptychopteridae, **50**, xliv, 331-35. **Becker, T.**—Berichtigungen zur monographie der Chloropiden, **49**, xi, 645-46. **Forbes, S. A.**—On black-flies and buffalo-gnats (*Simulium*) as possible carriers of pellagra in Illinois, **421**, xxvii, 21-55. **Johnson, C. W.**—Species of the genus *Gaurax* of the eastern U. S., **5**, 1913, 34-35. Insects of Florida, **153**, xxxii, 37-90. **Knab, F.**—Some neotropical Syrphidae. Names and synonymy in *Anopheles*, **420**, 1913, 13-17. **Malloch, J. R.**—A new genus and 3 n. spp. of Phoridae from N. America, with notes on ... *Crepidopachys* and *Pronomiophora*, **5**, 1913, 23-26. Descriptions

of n. spp. of American flies of the family Borboridae. Two n. spp. of D. in the U. S. National Museum collection, **50**, xlv, 361-372, 461-463. **Villeneuve, J.**—Notes synonymiques, **38**, xxxii, 128.

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Doings of Societies.

FELDMAN COLLECTING SOCIAL.

Meeting of January 15, 1913, at 1523 South Thirteenth Street, Philadelphia. Eleven members were present. President Haimbach in the chair.

The President read his annual address, which was ordered to be incorporated in the minutes.

The following officers were elected to serve for the year 1913: President, Frank Haimbach; Vice-president, H. A. Wenzel; Treasurer, H. W. Wenzel; Secretary, George M. Greene; Assistant Secretary, Chas. T. Greene.

Mr. Wenzel remarked on the genus *Eleodes* and particularly on a minute species collected by H. A. Wenzel in Southern Texas. This species is not in the American Entomological Society's collection or the Horn collection. He had sent this with three other species to Dr. Blaisdell (who has worked on this group for ten years, having had the material from the collections all over the United States) for confirmation, as he had worked it out in Dr. B.'s monograph as *debilis* LeC. The reply received was that the former was undoubtedly *debilis* and the other three, had they been found in Arizona or further north, he would pronounce to be all new species, but having come from Texas they might be Mexican, and he would have to look them up further in the Biologia Centrali Americana Coleoptera.

Two species of moths were exhibited by Geo. M. Greene; *Chloridea virescens* Fabr., collected on a window in City Hall by himself July 2, 1912; among other things this species in-

feasts the tobacco plant. *Mesoleuca vasaliata* Gn., from Roxborough, Pa., April 16, 1910, collected by C. T. Greene.

Adjourned to the annex.

Meeting of February 19, 1913, at 1523 South Thirteenth Street, Philadelphia. Nine members were present; Mr. John Pemberton, Jr., of this city, visitor. President Haimbach in the chair.

Mr. Wenzel stated that he had gone over *Cychnus* and had added many species to his collection of this group, which now numbers about four hundred specimens. These were exhibited. He said that it was peculiar that all the iridescent forms came from this side of the Rockies. His collection of *Dicaelus* was also shown, with only one known species missing.

Mr. Harbeck started a discussion on the Bot Flies, and extracts were read from Howard's "Insect Book." The chapter on Midges was also read by Mr. Wenzel, Jr.

Mr. Wenzel, Jr., said he had noticed small white larvae in the seed-pods of the wild hollyhock, *Hibiscus moscheutos*, at Essington, Pa., but none of the members knew the species.

Adjourned to the annex.

GEORGE M. GREENE, *Secretary*.

OBITUARY.

L. E. Ricksecker.

LUCIUS EDGAR RICKSECKER, well known to all American students of Coleoptera, died at his home in San Diego, California, January 30, 1913, (as was briefly announced in the NEWS for March, page 144), of an attack of angina pectoris, following a stroke of paralysis, nine months before, from which he had recovered but slightly.

He was born in Nazareth, Pennsylvania, January 14, 1841. From October, 1862, to July, 1863, he was a corporal in the 153d Pennsylvania volunteers. In 1868 he went to Salt Lake City, where for several years he was in charge of the Division Engineer's office of the Union Pacific Railroad, and later serv-

ed in a similar capacity on the Northern Pacific Railroad at Spokane. Since 1873 he has resided almost continuously in California, and was for many years county surveyor, or City Engineer, at Santa Rosa. Following the great earthquake and fire of 1906, in which he lost heavily, he went to Oakland for a year, whence in October, 1907, he moved to San Diego.

Mr. Ricksecker was an enthusiastic naturalist and a collector of objects of natural history from boyhood. At first birds' eggs, fossils and shells received his attention, but later, largely through the influence of Prof. O. B. Johnson, of the University of Washington (State), he became interested in insects, especially Coleoptera, of which he accumulated a valuable collection. These, with all other collections and his library as well, were totally destroyed in the catastrophe which, on the 18th of April, 1906, fell almost as heavily on Santa Rosa as upon San Francisco. He did not again attempt a private cabinet, but for several years he collected for sale Lepidoptera and Coleoptera about San Diego, among these a number of species new to science.

Mr. Ricksecker is best known to entomologists as a Collector of West Coast Coleoptera, and there is hardly a cabinet of any size in this country but that has been enriched by his efforts. While he has published very little, he has contributed from his experience much valuable information in letters to correspondents, notably, on the occurrence and habits of *Pleocoma*, and such fine species as *Pleocoma rickseckeri* and *Cychrus rickseckeri* have been named in his honor.

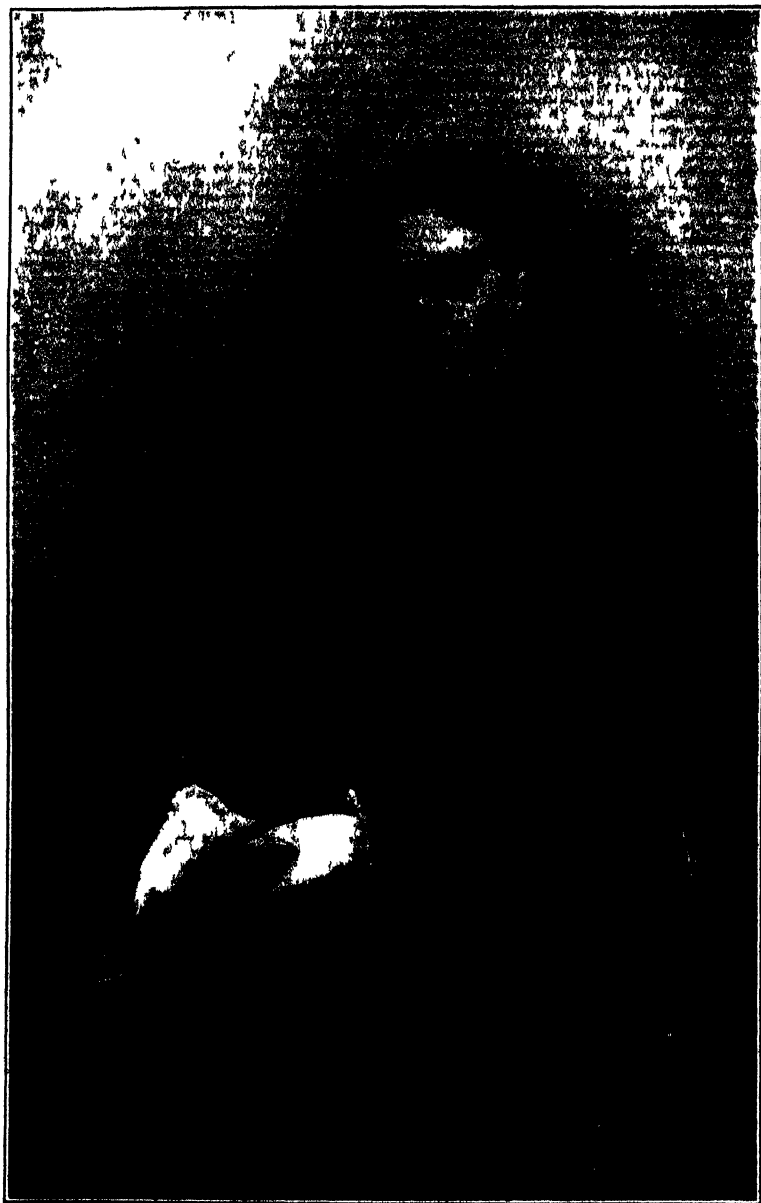
A correspondent for many years previously, I have, for the past dozen years, been personally acquainted with Mr. Ricksecker. I found him a good naturalist, well and widely informed; a courteous gentleman; a firm friend, generous and just in all his dealings—in short, a man that it was worth while to know.

Mr. Ricksecker was married in 1881 to Miss Henriette E. McFarland, of San Francisco, his second wife, who survives him.

H. C. FALL.

CORRECTION.

Page 186 (April News), lines 5 and 6. The paper on *Schlechtendalia* credited to Rigakuhakushi, C. S., should be credited to Sasaki, C.



MISS MARY ESTHER MURTFELDT.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXIV.

JUNE, 1913.

No. 6.

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Miss Mary E. Murtfeldt.

(Portrait, Plate VIII.)

Mary Esther Murtfeldt died at her home in Kirkwood, Missouri, February 23rd last.

She was born in New York, and there, at an early age, she suffered the serious illness which left her with a slight paralysis, so that for all her after life she was restricted in her walking. Otherwise she was robust and her physical infirmity seemed only to intensify her mental powers.

With her family she early moved to Rockford, Illinois. Here in Rockford College she received the education that the schools could give. In 1869 she moved to St. Louis, where Miss Murtfeldt met Prof. C. V. Riley and on account of her extensive knowledge of botany became an invaluable associate worker to him. In 1871 the family moved to Kirkwood, a suburb of St. Louis, where she lived ever since.

Her learning, which was so profound in her special work

of entomology and was so broad that it reached all subjects of interest to cultivated people, was largely acquired by herself.

She was particularly interested in the life histories of the microlepidoptera and began writing on entomological subjects in 1870. From that time to her death she contributed many articles to scientific journals. In 1891 there appeared from her pen a book entitled "Outlines of Entomology," prepared for the use of farmers and horticulturists at the request of the Secretary of the State Board of Agriculture and the State Horticultural Society of Missouri.

She was associate editor of "Farm Progress," published in St. Louis; a Fellow of the American Association for the Advancement of Science and a member of the Academy of Sciences of St. Louis.

HERMANN SCHWARZ.

[*American Men of Science* adds that she was Assistant to the State Entomologist of Missouri, 1876-1878, and acting State Entomologist, 1888-1896; field agent of the Division of Entomology, United States Department of Agriculture, 1880-1893; staff contributor on entomology and botany to the *St. Louis Republic* since 1896.]

Notes on Mosquitoes (Dipt.).

By HERMAN H. BREHME,

In charge of the Mosquito Extermination Work at the New Jersey Agricultural Experiment Station, New Brunswick, N. J.

The summer of 1912 was a normal one until the first part of August, when heavy showers set in, consequently favorable for prolific production of mosquitoes. Complaints were received from the southern part of the State and especially along the shores of Barnegat Bay. Upon investigation, the species most troublesome proved to be *Aedes sollicitans*. In the northern section it helped *Culex pipiens* along. *Sollicitans* was very rare in the northern part of the State all season.

The house mosquito, *C. pipiens*, was nearly absent in Essex

County until August 22, when there was a slight invasion in the northeastern section of Newark. In Hudson County it was the predominating species, as very little work had been done to check the breeding. In Union County *pipiens* was reduced considerably by the continued oiling and filling in of the breeding places and not many individuals were noticed throughout the season.

Anopheles maculipennis was very abundant throughout the State, more so than in previous years, and larvae could be found in the eddies of all brooks, in among the grass along the edges of brooks, and in almost any grassy pool scores of larvae could be found. The most prolific place that was discovered for this species was near White City in Mercer County. The swamps in that section were alive with them.

Anopheles punctipennis was very abundant throughout the State and larvae were found almost anywhere until November. The most prolific place for this species was found near Princeton.

Anopheles crucians was quite rare throughout the entire season and only odd specimens, all in the larvae stage, were noticed and these were found on the saltmarsh along Barnegat Bay.

Psorophora ciliata was apparently rare throughout the season. Few larvae were noticed and not many adults were seen anywhere. The prolific breeding places for this species in Essex County have been eliminated.

Aedes sayi was plentiful in the Great Piece Meadows (Essex County) during the latter part of August. As this is one of the most ferocious species in the State it made life miserable for both man and beast in that region.

Aedes jamaicensis was very rare and no records were made at all.

Aedes cantator was not as abundant in the northern part of the State as in 1911; in the southern portion, however, it was very plentiful and in exceedingly large specimens. The first brood hatched early in May and they held on for nearly six weeks, and no more hatching took place until early in September, when they appeared in association with *solicitans*.

It was not the predominant form as in previous years, *sollicitans* outnumbering them ten to one.

Aedes sollicitans made its appearance as the first brood of *cantator* was disappearing, which is the usual habit. This species was very rare in the northern part of the State until September, when a fair-sized brood emerged on the Newark and Elizabeth meadows due to the extremely high tides. In the southern part of the State they were very abundant the biggest part of the season, in fact so ferocious that horses broke their harness to get away from the torturing pest. The natives claimed that mosquitoes were not so bad in twenty years, and that was undoubtedly true.

Aedes taeniorhynchus appeared to be exceedingly rare and only two specimens were taken until the first part of September, when a small brood emerged on the Cheesequake meadows (Middlesex County), this being the only locality from which any have been reported.

Aedes sylvestris appeared in vast swarms through Essex, Hudson and Union Counties in May and June, and these were at first all taken for *cantator* by the local county inspectors until the difference was pointed out.

Aedes triseriatus was found both in Union and Essex Counties, mostly in tree holes; only on one occasion has it been found in rainwater barrels during the past season.

Aedes pretans occurred in great numbers in the early spring in the Great Piece Meadows. After the first hatching trouble began with this species which continued throughout the season.

Aedes dupreei was found abundant in July along the edge of the Great Piece Meadows and was rather troublesome for a period of three weeks, when it disappeared.

Aedes subcantans made its appearance in the Millburn-Short Hill section as usual. A considerable number were taken by the local county inspectors for *cantator*. The breeding places for this species are being eliminated and it will soon become rare in this section.

Aedes abfitchii associates with *subcantans* and was found plentiful in the Millburn-Short Hill section until July.

Aedes canadensis occurred quite generally throughout the

wooded portions of the State, and in some places in exceptionally large numbers, especially so in the western section of Essex and Union Counties.

Culex restuans was not common and only odd specimens were taken near the sewer outlets on the Newark Meadow.

Culex salinarius was very rare all season with the exception of September, when a considerable number were found on one section of the Newark Meadow. This being a more northern species and the breeding places in that section rapidly being eliminated means that this mosquito will soon become rare in New Jersey.

Culex territans was found quite abundant in the fresh water pools and more so in spring water. In the northern section of the State this species will soon disappear, as breeding places there are being eliminated very rapidly since the County Mosquito Extermination Commission got to work.

Wyeomyia smithii was not at all rare wherever the "pitcher plant" grows, in which it breeds, but more so in the vicinity of Tuckerton along the edges of the ponds where this plant grows in abundance.

The Meloidae (Blister-beetles) of North Carolina (Col.).

By FRANKLIN SHERMAN, JR., State Dep't. of Agriculture,
Raleigh, N. C.

For the benefit of students of faunistic entomology, and to place on record some notes which seem worthy of publicity, the present paper on the family Meloidae of North Carolina has been prepared. The list shows a total of 21 species on record, as compared with 14 for New Jersey (Smith), 22 for Indiana (Blatchley) and 18 for District of Columbia (Ulke). The family is well known to be one of western and south-western distribution in the United States. It is quite likely that some additions will be made to this list in future, but it is believed to be reasonably complete.

The genera are arranged alphabetically, and the species alphabetically under the genus.

EPICAUTA.

- E. batesii** Horn. Southern Pines, A. H. Manee.
E. cinerea Forst. Taken at several points, Raleigh and Southern Pines westward, June to September inclusive. Has damaged clematis.
E. marginata Fab. More common and widespread than the preceding, of which it is often regarded as a variety. Taken at many points throughout the state, July to September inclusive. Damages egg-plant, potato and clematis, also feeds on tomato and pig-weed (*Amaranthus*).
E. pennsylvanica DeG. Throughout the state, July to October inclusive, abundant on flowers, especially composites, and particularly golden-rod. Our commonest species.
E. strigosa Gyll. Taken at five scattered localities from Greensboro eastward, mid-June to late August. Feeds on the flowers of "wild sweet potato" (*Ipomoea pandurata*). (C. S. Brimley.)
E. trichrus Pall. Eight localities, Raleigh and Southern Pines westward, late June to September 20. Probably occurs in east also. Same food habits as preceding.
E. vittata Fab. With us this seems to be one of the scarcer species. Three localities, all east of mountains, but probably occurs in the mountains also. Raleigh, July; Beaufort (on coast), August; Newton, August and September.

MACROBASIS.

- M. unicolor** Kirby. Southern Pines, August, September; not uncommon under lupine (A. H. Manee). Also taken at three mountain localities in June and July.

MELOE.

- M. americanus** Leach. Blantyre (in mountains), early May. The species presumably occurs throughout the mountains at least.
M. angusticollis Say. Mount Mitchell (above 3000 ft.), early October. Presumably occurs throughout the mountains.
M. impressus Kirby. From three widely-separated localities in the middle part of state. January and February. Twice complained of (in February) as a pest on turnips. Specimens of the genus *Meloe* (species undetermined) have been sent to us as feeding on cotton and clover.

NEMOGNATHA.

- N. bicolor** Lec. Southern Pines (A. H. Manee).
N. cribraria Lec. Raleigh (C. S. Brimley).
N. nemorensis Hentz. Greensboro, early September (S. W. Foster).

- N. piezata** Fabr. Southern Pines, common (A. H. Manee), Southern Wake County, early July. This is the only species of the genus that we have ever considered common. Found on flowers and believed to feed on pollen and nectar which the prolonged maxillae enable it to reach.

POMPHOPOEA.

- P. aenea** Say. Raleigh, April, one under maple tree. Ellenboro, late March, 1903, exceedingly abundant on blossoms of peach and plum—later reports stated that when oaks bloomed they left the fruit trees for the oak catkins.
- P. polita** Say. Southern Pines (A. H. Manee).
- P. unguicularis** Lec. Blowing Rock (about 4000 ft.). June 8th to 25, 1901—at this place and date this handsome species swarmed in untold thousands on peach, rose and mountain laurel (*Kalmia*). On laurel they ate the blossoms, on peach they ate the leaves, apparently preferring those that were affected with leaf curl disease.

PYROTA.

- P. germari** Hald. Raleigh (C. S. Brimley).

TETRAONYX.

- T. 4-maculatus** Fab. Taken at three localities in the east-central part of state. At times common on the butterfly pea and "wild sweet potato."

ZONITIS.

- Z. bilineata** Say. Newton, a number taken in August, 1906.

Additions to the New Jersey Tipulidae (Diptera), with the Description of a new Species.*

By M. D. LEONARD, Ithaca, N. Y.

The following species of craneflies have not, as far as I have knowledge, been heretofore recorded from the State. In those cases where no name is mentioned the specimens were taken by the author. My thanks are due to Mr. C. P. Alexander, of Cornell University, and Dr. Frank E. Lutz, of the American Museum of Natural History, the former for looking over this paper and supplying a record, the latter for supplying two records. The text figure was drawn by means of the projection microscope in the Entomological Laboratory of Cornell University.

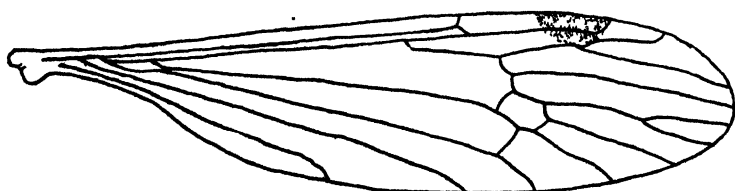
*Contribution from the Entomological Laboratory of Cornell University.

- Gonomyia subcinerea** O. S., 1 male, Ridgewood, July, 1911.
Rhypholophus apicalis Alex., male and 2 females, Ridgewood, July, 1909.
Adelphomyia americana Alex., 2 specimens, Ridgewood, Sept. 16, 1910.
Dicranomyia monticola Alex., 1 specimen, Ridgewood, July, 1911.
Amalopsis calcar O. S., 1 male, Hackettstown, May 21, 1910; 1 female, Newfoundland, May 29, 1910. (Dr. F. E. Lutz.)
Limnophila areolata O. S., 1 male, Hackettstown, May 22, 1910.
Limnophila aprilina O. S., very common at Ridgewood resting on shelving rocks near water during July, 1911.
Limnophila noveboracensis Alex., Grove St. Woods, Ridgewood, N. J., June 21, 1911.
Eriocera fultonensis Alex., Singac, Passaic Co., July. (Mr. C. P. Alexander from specimens sent by Dr. W. G. Dietz.)
Limnophila albipes n. sp.

Holotype. *Head.*—Front gray, with dense silvery pubescence except around the upper border of the eyes; antennae nearly twice the length of the head and thorax together; basal segment cylindrical, pale yellow, and twice as long as the second, which is subglobose and yellow; first segment of the flagellum considerably longer than the two segments of the scape combined, cylindrical and dark brown, except for the base, which is yellow; remaining segments dark brown, fusiform, becoming more slender near the tip of the flagellum, clothed with dense whitish pubescence, hairs not verticillate; palpi yellowish gray.

Thorax.—Mesothoracic praescutum brownish yellow, somewhat shining but still covered with a very fine whitish pubescence; median brown line almost obsolete; pleurae yellow; halteres yellowish, knob somewhat infuscated.

Wings.—Hyaline, veins brownish; subcosta ends about the middle of the sector; the radial cross-vein is nearly obsolete but is situated near



the end of R₁, which is curved up beyond it to the costa; stigma present just behind it but not very distinct; petiole of cell R₂ (first submarginal cell of authors) distinctly longer than the basal deflection of Cu₁ which meets cell 1st M₂ (discal cell of authors) at about the middle.

Abdomen.—Dark brown above, paler beneath, pubescent; hypopygium yellow.

Legs.—Coxae yellow; rest of legs brownish yellow except the femur, which is somewhat infuscated at the tip; also the 3rd and 4th segments of the fore and middle tarsi infuscated; segments of the hind tarsi white except the tip of the 5th segment and the claws, which are brownish.

Length of body.—4 mm.; of wing—5.5 mm.

Allotype.—1 female. Same as the male with the following exceptions: Ovipositor yellow; antennae only about as long as head and thorax together.

Paratype.—1 ♀ in which the venter of the abdomen is nearly as dark as the dorsum.

The holotype is C. U. Coll., Lot 392. The allotype and paratype are in the author's collection.

The specimens were collected by the author at Ridgewood, July, 1911.

The antennae of this species have a peculiar twisted appearance similar to those of *L. laricola* Alex., which, however, has no white on the feet. It belongs to the *poetica*, *niveitarsus* group.

Dolichopeza americana Ndhm., Ridgewood, July 15, 1911.

Besides the above species should be mentioned the capture of a specimen of *Aeshnosoma rivertonensis* Johnson, which is, I believe, the second male ever taken.

Notes on Some North American Noctuidae (Lepid.).

By F. H. WOLLEY DOD, Midnapore, Alta, Canada.

Pseudanarta dupla Smith (Journ. N. Y. Ent. Soc. xvi. 89, June, 1908.)

=*flava* Grt.

This synonym is really Sir George Hampson's, but though he called my attention to it four years ago, he has never published it. Smith made his description from two males, one from Stockton, Utah (Spalding), and the other from South Park, Colo. (Bruce). The type at Rutgers College is from the latter locality, and I have a Stockton male compared with it. The Stockton co-type was sent to the British Museum, and found to agree with Grote's type of *flava*, a male from British Columbia, collected by J. R. Crotch, according to the description. Grote also mentions a specimen from Colorado, from T.

L. Mead. I have numbers from Stockton but never saw a British Columbia specimen other than the type. Smith committed the error of doing what he had done in many cases before. He recognized that he had two species before him that had been passing as *flava*, and was over-hasty in deciding which of these was really Grote's species, and described the other as *dupla*. The result was that he redescribed Grote's species, leaving the other (*Crocea*, Hamps., nec Hy. Edw.) unnamed.

P. crocea Hy. Edw.

There are two female types from Dallas, Oregon, in the Henry Edwards' collection in the New York Museum. I have a number from Stockton, and have compared one of my females with these types, finding it slightly larger and darker only. Grote referred *crocea* as a pale variety of his *flava*, and Smith went even further and made it a synonym until 1908, when he characterized it as distinct after comparison with the type, though entirely omitting Oregon from the habitat. I did not find the species in the British Museum when I visited it in March, 1909, but another species stood under the name, and is described and figured as *crocea* in the catalogue.

I did not then know that the species was not *crocea*, and left a few specimens of an unknown species with Hampson. This I discovered a year later was the *crocea* of Smith's collection, which I found to be correct by Henry Edwards' types. The specimen figured in Holland's Moth Book, pl. xx. f. 40, as *singula*, is this species. The *flava* of Smith's collection was the *crocea* of Hampson, and of course the one which Smith ought to have described as *dupla* but didn't. I now name this species on the basis of Hampson's description and figure.

P. caeca nom. nov.

=*crocea* Hamps. Cat. vi. p. 194. pl. ci. f. 9, 1906, nec Hy. Edw.

=*flava* Smith, Journ. N. Y. Ent. Soc. xvi, 88, 1908, nec Grt.

I leave Sir George Hampson to choose the type. He figures a Colorado specimen, and others from there and one from Oregon are in the collection. I saw a Nevada male and a

Colorado female in the Henry Edwards' collection, and have a series in my own from Stockton, Provo and Eureka, Utah, from which latter locality I have *flava*, *crocea* and *singula* also.

Flava has a short black basal streak which *caeca* lacks. In *flava* the t. p. line is not always angulated in submedian fold as stated in Hampson's tables, but is often curved merely. The line in *caeca*, however, is much more even, as is also the terminal line, and the s. t. space is wider. Both have a fine black streak in s. m. fold, joining the t. a. and t. p. lines, and *caeca* is best characterized by having a pale ochreous streak immediately above this, which is the palest mark on the fore wing. The whole of the upper portion of the median space in *caeca* is tinged with ochreous. In *flava* it is reddish brown. In *flava* the geminate t. p. line is whitish filled, the white broadening out into a patch at the angle or bend in the s. m. fold. In *caeca* the filling is concolorous with the rest of the s. m. space, though there is a creamy white patch in the s. m. fold. The black band on secondaries of *caeca* is more even on its inner edge. Both wings beneath are much paler in *caeca* than in *flava*; in fact my Utah *caeca* have no yellow tinge beneath the primaries at all. Both have a conspicuous black discal spot beneath secondaries, and the discal spot beneath primaries referred to by Smith as present in *dupla* but absent from "*flava*" (*caeca* meant), is sometimes present in both. *Caeca* has shorter wings and blunter apices.

Crocea has proportionately broader wings than either, and is a much grayer species, without any distinct reddish or ochreous shades. A short discal streak seems variably present or absent. The t. p. and s. t. lines are more as in *flava* than *caeca*. The discoidal spots are distinctly outlined in grey, which is not the case with the other two species, at least in my series. Hampson says of *caeca* (under *crocea*), "orbicular and reniform . . . with whitish annuli," but this is not shown in the figure. There is no blackish streak in submedian fold centrally in *crocea*, but there is a pale grey or creamy white patch across the median space just below the discoidals, and this sometimes extends upwards to obliterate the lower edges

of the spots, and even sometimes fills the reniform. This is perhaps the most obvious characteristic of the species, and is clearly shown in Holland's figure under the name of *singula*. That specimen, however, is much darker than any *crocea* in my series. Both *crocea* and *flava* have a few black dentate marks in the termen near the apex, which my *caeca* lack. The black border to secondaries in *crocea* is broader than in either of the others, and has the even inner edge of *caeca*. Beneath there is no sign of a discal spot on any of the wings of any of my specimens, and it differs also from both the others in having a broad and well defined blackish border to primaries as well as to secondaries.

The above comparisons are made from Utah specimens only, with the addition of a single *crocea* from New Mexico. The three are easily distinct, though some of the characters referred to of course might not hold good in other localities.

***Acronycta laetifica* Smith.**

This was described from a number of specimens from New York, New Jersey, and Florida. Types were stated to be in the collections of the U. S. National Museum, Rutgers College, Cornell University, and Messrs. Graef and Doll. Those in the two former collections I have examined. At Rutgers College was a male co-type from New York, and a female from Florida. At Washington I found the male type from Florida, a female and male co-type without locality label, and another female which my notes say was also marked "type," though possibly really only a co-type, from New York. Smith states after the description that the species with which it is most likely to be confused is *occidentalis*. That is, or was, so far true that I venture to state that the male type in the Washington Museum actually is *occidentalis*, or perhaps I should say, using the prior name, *interrupta*. My notes say: "The male type from Florida is a well marked *interrupta*, creamier than usual, and has the slightly ochreous-tinted reniform of that species. Specimens standing apparently correctly in the *interrupta* series are just like it." All the rest I saw marked

type or co-type appeared to be distinct from any other described species that I know, so that the name will hold after all. Smith wrote furthermore: "The species has been confused with *furcifera*, with which it really has very little in common." To the latter part of this statement I cannot agree, as I think it could easily be mistaken for a pale creamy *furcifera*. Hampson's figure gives a good idea of it, but is really too brown and highly colored. I have a female from Milwaukee Co., Wisconsin, collected by Val. Fernekes, and a male bearing the name of the same collector stood with the series at Washington.

***Arsilonche colorada* Smith.**

This was described in 1900 from two females from Glenwood Springs, Colorado. One of these is in the Washington Museum and has been labeled "type" in Smith's own handwriting. It is not an *Arsilonche* at all, but is identical with Sir George Hampson's type of *Cea cirphidia*, described from two females taken by D'Urban at Santa Barbara, California (Cat. ix. 280, 1910). I have a female specimen taken by Mr. T. Spalding, at Vineyard, Utah, on Sept. 14th, 1909, which I have compared with both types. The species has a rounded frontal prominence, bare of scales, and a divided anterior thoracic crest. Hampson mentions a spreading metathoracic crest also. It certainly exists in my specimen, but is not nearly as prominent as that shown in his woodcut. In the Washington collection I came across three greasy specimens, at least two of them males, labeled Pullman, Washington, Aug. 30th-Sept. 9th, 1898, standing mixed with *Leucania heterodoxa*, to the pale forms of which the species certainly bears some superficial resemblance. That was in February, 1910. My specimen has a small blackish spot at the lower angle of cell. Hampson's specimens also have two similar spots just beyond the angle, and one beyond upper angle. These are not shown in the figure. Smith does not mention them in his description, nor do my notes say that I noticed any in his type. It is to be assumed that the other specimen referred to in his description

is either a type or co-type, and probably in the Rutger's College collection. If it is there I overlooked it.* There is a possibility that it is not the same species as the type at Washington, though there is nothing in the description to suggest that the two specimens were not exactly alike. Hampson replaces *Arsilonche* Led. by *Simyra* Ochs., and under *colorada* Smith, describes and figures a Denver male which seems an *Arsilonche* all right, very near, or identical with *henrici*, and which is at any rate not a bit like *cirphidia*. The specimen happens to be greasy.

Before referring *cirphidia* to *colorada*, it will perhaps only be fair to wait and see what Smith's other type or co-type turns out to be.

***Platisenta albipuncta* Smith.**

This was described from nine males, eight of them from Harris Co., Texas, and the other from Colorado Springs. Smith sent me Shovel Mt., Tex., specimens nearly ten years ago, and I have a Harris Co. series from Mr. George Frank, who supplied the types. I have no note of the actual type, but have seen a co-type in the British Museum. I have *videns* from Pittsburgh, Pa.; Shelby, Ohio; and Chicago, and have compared a great many more with Texas specimens, and see no reason whatever for keeping them distinct.

Smith says under the description of *albipuncta*: "Like *videns* in appearance, but paler, not so reddish, not so glossy in appearance, and more contrastingly marked." Hampson thus separates them in his tables:

"*Videns*. Fore wing rufous" and "*albipuncta*. Fore wing ochreous, slightly tinged with reddish brown."

The types of *videns* Guen., and *indigena* Walk., are from Florida, and that of *atriciliata* is labeled "U. S. A." These are one species, as treated by Hampson and Smith. Why *albipuncta* should ever have been considered distinct I cannot discover. The differences between a series of each are, at best, hard to find, and I have Shovel Mountain and Pennsylvania specimens absolutely identical.

*I find that Smith wrote me later that the species was not in his collection. (F. H. W. D.)

Caradrina mantalini Smith.

= *Agrotis nanalis* Grote. (Barnes and McDunnough, Contr. Nat. Hist. Lep. N. Am., Vol. I, No. 4, p. 5, pl. I. f. 12.)

Mantalini was described from "two females," from Colo. (Bruce), and Glenwood Springs, Colo. (Barnes). My notes say that both types are males. Dr. Barnes has the Glenwood Springs type, and the other is in the Washington collection, where are also two females from Nevada Co., Calif., each bearing the museum red "type" label, though they can't be types on the strength of it. Grote's type of *nanalis* is a male from Nevada, though Smith's copy in the Agrotid Bulletin of Grote's description reads female. Messrs. Barnes and McDunnough's reference is perfectly correct, and the synonymy has been known to Sir George Hampson for some time. The species has strongly spined tibiae, and is not a near relation to *Caradrina miranda* with which Smith associated it. Hampson places *nanalis* in *Lycophotia* Hbn., of which he makes *Peridroma* Hbn., and *Setagrotis* Smith, synonyms.

Caradrina spilomela Walk.

This is not in Smith's list, but stands in Dyar's catalogue as prior to *conviva* Harv., and is figured by Holland. Hampson makes *triplex* Walk., a still prior name, and adds *contraria* H.-S., and *subaquila* Harv. to the synonymy. The types of all except *contraria* are in the British Museum. *Triples* is a badly worn female from Honduras. I have no note of its color. *Spilomela* is an A1 specimen, a yellowish female from Haiti. *Conviva* is a Texas male, about the color of *extima*, and *subaquila*, also a Texas male, is very dark reddish, and is the "ab 2" of Hampson. It appears to be a very variable species inhabiting the Southern States, Central America, and the West Indies. The synonymy may as well be accepted. Hampson makes it the type of his new genus *Micrathetis*, in which he places only two other species, *dasarada* Druce, from the same general region, though not yet recorded from north of Mexico, and *canifimbria* Walk., from Brazil.

***Caradrina insipida* Strecker.**

This was described from two Wisconsin specimens. One of them was said to be about the color of *meralis*, and the other more reddish brown. It was stated to be nearest *fragosa* Grote. I saw the types in March, 1910. One is a rubbed male, the other, a merely fair specimen, a female. The species is very doubtfully distinct from *Orthosia inops* Grote, of which Hampson figures the type, also a bit worn, under the genus *Amathes*. I have had a badly worn Calgary male in my collection since 1893, which I identified as perhaps this only after seeing Grote's type. I have also compared with mine, and taken notes on, a male taken at High River, Alta., by Mr. Thomas Baird, which I subsequently saw in Prof. Smith's collection standing under *inops*, with a few from Kittery Point, Maine, the type locality. Smith mentions in his notes in Trans. Am. Ent. Soc. xxxiii, 351, 1907, that there are probably two species confused under *inops*, but that the forms are too rare, and available specimens too poor to make sure of. Closely associated with the *inops* series in his collection, I saw a few specimens from Cohasset, Mass.; East River, Conn.; Winnipeg; and Sable Island. It certainly looked as if there might be two species, so I refrain from referring *insipida* definitely to *inops* at present.

***Hadena finitima* Guen.**

Dyar omits this name from his catalogue, substituting *basilinea* Schiff. Smith takes exception to this in Can. Ent. xxxv. 134, 1903, and claims that they are distinct species, figuring the genitalia of each, and of *cerivana*. He appeared to admit that the latter was a mere variety of *finitima*, and Dr. Dyar follows him in Proc. U. S. N. M. xxvii, 812, 1904. Smith in his 1903 Check List, however, places all three names as distinct North American species. There can be no justification for this, as it has not yet been satisfactorily shown that *basilinea* and *finitima* are really distinct at all. Hampson, in *Trachea*, keeps them separate, differentiating them in his tables by color.

"Fore wing grey, the medial area tinged with rufous; *finitima*.

Fore wing wholly tinged with rufous or red-brown; *basilinea*."

These color differences are as a rule rather strongly marked, but they sometimes scarcely hold, and I possess North American specimens marked Stonington, Conn., which differ but very slightly from some British specimens in my collection, including some collected by myself in the midlands.

Staudinger places *finitima* (through a misprint spelled *fic-tima*) as a variety of *basilinea*, and refers *basistriga* Staud. and *cinefacta* Graes. as synonyms of the variety, of which he gives the distribution as North America, Siberia, Japan and Norway.

Cerivana Smith, from Calgary, is a form in which the ground color is paler still, the median space about concolorous in the type specimens, but with a diffused reddish median line. Some have the entire central area more or less reddish, except the spots, as is usual in *finitima*, but the most obvious character is the pale ground. The form occurs in Manitoba and at Kaslo, British Columbia, and from Vancouver Island I have specimens very much like it, as well as others nearer eastern *finitima*. It seems best to list the forms as follows:

Hadena basilinea Schiff. Ground color ochreous, or slightly reddish.

var. *finitima* Guen. Ground color grey, usually with central area red-brown.

var. *cerivana* Smith. Ground color paler grey, typically without central area reddish. [The British variety *cinerascens* Tutt must be something near this.]

I have studied more material since my notes on these forms in Can. Ent. xliii. 230, 1911. Hence the foregoing.

The New President of the Entomological Society of London.

Mr. G. T. Bethune-Baker, whose article on *Everes comyntas* and *amyntula* appeared in the NEWS for March and April last, was elected President of the Entomological Society of London, at its meeting of January 15, 1913. He has been an extensive writer on the Lepidoptera, two of his larger papers being those on "New Noctuidae from British New Guinea" (Novit. Zool. XIII, July, 1906) and "A Revision of the African Species of the *Lycaenesthes* group of the *Lycaenidae*." (Trans. Ent. Soc., Lond., July 19, 1910).

The Medio-anal Link in Agrioninae (Odonata).

By E. B. WILLIAMSON, Bluffton, Indiana.

Venational characters may generally be described in a variety of ways; and the number of ways depends largely on the complexity of relationships of the part or character defined or described. I do not refer to the use of synonyms (as triangle free, triangle uncrossed), but to those characters which for their definition depend on some expressed or implied relationships with other characters or parts. It may be taken for granted that, in describing any part of the wing, that description is best which is clearest, and which places most importance on evolutionary changes of that or related parts. Moreover, it is desirable that all workers should be in harmony in their use of terms and their conception of evolutionary changes. When such harmony exists, uniformity of descriptions will inevitably follow.

The Agrioninae alone remain about as the genius of de Selys, expressed in his classification, left them. His Legion *Lestes* has properly been given subfamily rank, but on no characters not recognized by him. It is certain that the contents of others of his legions and "grandes genres" will be altered more or less, and also that many of his groupings or divisions under his subgenera will be described as genera. Probably thus more Agrionine genera will be described in the future than all other Odonate genera yet uncharacterized. Moreover, the literature may be expected to be voluminous, and for this reason uniformity in descriptions is desirable and possible.

For venational descriptions the Comstock-Needham system seems most desirable; and Needham in his *Genealogic Study* called attention to the evolutionary changes which have taken place in the veins forming the distal (apical) ends of the quadrangle and subquadrangle. Later I named these two parts in the Calopterygidae the medio-anal link. The medio-anal link may now be defined as the cross vein forming the distal end of the quadrangle and that part of Cu₂ opposed to Cu₁ and placed transversely to the long axis of the wing.

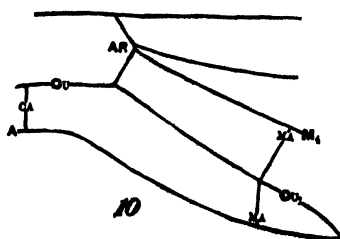
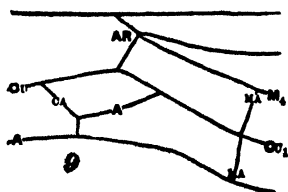
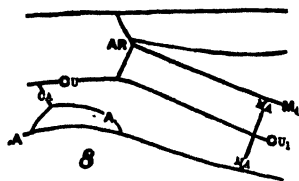
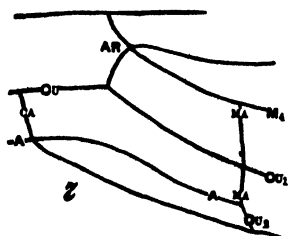
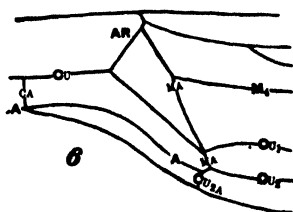
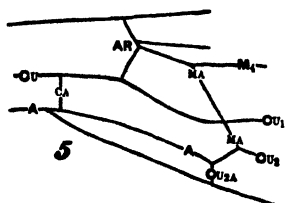
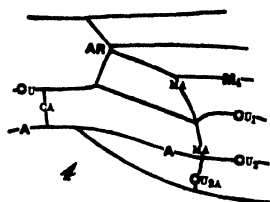
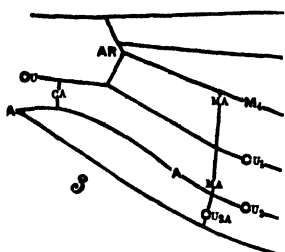
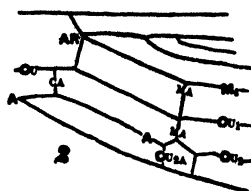
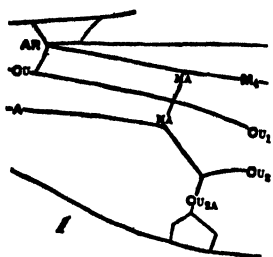
In the figures accompanying this paper, the medio-anal link is labeled MA at either extremity. Thus in Figs. 5 and 6 MA alone does not form the distal end of the subquadrangle; and in Figs. 8, 9 and 10 MA really does not link M with A, though I believe the use of the term in these three cases will be found desirable. However, this is one of the purposes of this paper, to bring out the opinions of others on what terms and expressions are most desirable in these parts in Agrionine wings. In the ten figures, the first two show Calopterygine wings which, in the relations of MA, show a generalized structure. From this condition two distinct evolutionary lines exist, I believe, in Agrioninae (sens lat.). In one case MA is the center of evolutionary activity, at first little differentiated from the cross-veins which follow it, set at nearly right angles against M₄, with Cu₂ appearing as a continuation of A. Figures 4, 5 and 6 show a rapid change in these characters, MA and M₄ forming first a symmetrical fork and then in Fig. 6 MA appears as a continuation of the basal part of M₄, while bracing takes place posterior to MA, and A and Cu₂ are no longer in the same line. The other line of evolution is shown in Figs. 7, 8, 9 and 10. Here MA undergoes no changes except those involved in the reduction of the posterior wing area. In Fig. 7, A is continued to MA, and Cu₂ beyond MA is present as a short spur. When, as in Figs. 8, 9 and 10, Cu₂ is confined to MA, A passes CA (cubital-anal cross-vein) to return to the wing margin (Fig. 8), to switch against the quadrangle (Fig. 9), or terminates at CA (Fig. 10), in which last case wing reduction reaches its maximum.

EXPLANATION OF FIGURES.

Figure 1. Typical Calopterygine wing-e.g. *Calopteryx*.

Figure 2. A Calopterygine wing-e.g.—*Diphlebia*, which shows Agrionine affinities in MA as well as in its antenodal characters.

Figure 3. Representatives of such genera of de Selys' legion Platycnemis as *Platyscelus* (*Platycnemis*), *Idiocnemis*, *Tatocnemis*, *Coelliccia* (*Trichocnemis*), *Copera* (*Psilocnemis*), *Allocnemis*, and *Chlorocnemis*, (but not *Calicnemis* or *Leptocnemis* [*Hemicnemis*] in the former of which A and Cu₂ are not in the same line but are as in Figure 5, and in the latter of which MA and its parts are as in Figure 5); and in the



following genera of the legion Podagrion: *Heteragrion*, *Podopteryx*, *Argiolestes*, *Rhipidolestes*, *Wahnesia* (but not *Synlestes*).

Figure 4. Representative of *Teinobasis* of the legion Agrion, and *Paraphlebia* of the legion Podagrion, and generally in the legion Pseudostigma.

Figure 5. Representative of the legion Agrion, with the omission of *Teinobasis* (and possibly other genera not known to me).

Figure 6. Representative of the legion Lestes. (*Ortholestes* has the proximal angle of MA with M₄ much less obtuse).

Figure 7. Representative of the following genera of the legion Protoneura: *Coenoneura* (*Neoneura*), *Idioneura* and *Disparoneura* (excepting de Selys' Group 3 of the last).

Figure 8. Representative of de Selys' Group 3 of *Disparoneura* of the legion Protoneura.

Figure 9. Representative of *Palaemnema* and *Platysticta* of the legion Protoneura.

Figure 10. Representative of *Protonneura*, *Nososticta*, *Caconeura* (*Alloneura*), *Microneura*, *Isosticta*, and *Protosticta* (the last three genera not known to me) of the legion Protoneura. In *Selysioneura* Cu₁ is not produced beyond MA.

On the Recurrence of *Thecla wittfeldii* Edw. (Lep.).

By WILLIAM PHILLIPS COMSTOCK, Newark, New Jersey.

Doctor Skinner tells us in ENTOMOLOGICAL NEWS, Vol. xviii, page 23, "*Thecla wittfeldii* has not been found since the original catch in 1883. The vegetation on the spot where Dr. Wittfeld took it, on the Indian River, Florida, has been destroyed by cultivation."

However, in looking over some material recently with Doctor Skinner, we found a male specimen of *T. wittfeldii* bearing the label "Jacksonville, Fla., May 5, '04," which was captured flying around oak by Mrs. A. T. Slosson.

This interesting discovery is supplemented by the record of two other specimens from the collection of the late Otto Seifert which are in my possession. These, both males, were captured by Dr. Seifert on May 13th at Island Grove, Florida, the year of capture being unknown to me. Further, Mr. William T. Davis captured at Lakeland, Florida, on May 6 and 8, 1912, three females which are typical with the exception that the discal line of the primaries is edged within with

white, whereas in the original description it is referred to as having a single white line outwardly. The first two were taken on the 6th near Lake Hollandsworth, where the country was tolerably dry, either on the hill up from the lake or in a grove which was also high and dry; and the third specimen was taken in similar upland oak country near Lake Parker.

Mrs. Slosson has also given me the only known fact concerning the life history. To quote her letter: "I found a greenish slug-like larva on oak (species of *Quercus* uncertain) in May, 1904. It was torpid and became a chrysalis almost at once, so I made no detailed description. My specimen is a female and shows the inner white line faintly on discal bands of both wings." This larva was taken at Jacksonville, Florida.

The character of the inner discal white line is an interesting development, so far known only in the female specimens, which occur both with and without it. Whether this is of sufficient value to warrant a varietal name is an open question in my mind. If we may judge from *T. calanus*, the nearest ally to *T. wittfeldii*, the presence or absence of this inner line is subject to the utmost variability and is not now considered of varietal significance in that species.

These new records are of considerable interest as they extend the range of the species by three more definite localities and indicate the season in which to be on the watch for the species.

The original description of *T. wittfeldii* appeared in the Canadian Entomologist, Vol. XV, page 136, and Mr. William H. Edwards mentions only the year of capture, 1883. The types, which are three males and one female, are in the possession of Dr. W. J. Holland in Pittsburgh, and there are specimens from the original catch in the Henry Edwards collection at the American Museum of Natural History in New York City, and in the collection of Dr. Skinner at the Academy of Natural Sciences in Philadelphia. These last specimens are one male and two females taken in June, 1882, by Dr. Wittfeld at Georgiana, on the Indian River, Florida.

I should be much interested to hear of any other records of

this insect, and I think that collectors in Florida would find it worth their while to keep a sharp lookout for it about the dates mentioned and endeavor to secure more specimens and get some further knowledge of the life history of this striking and so far rare butterfly. The four recorded localities would indicate that the species has a range extending over the northern half of Florida and in all probability its rarity in collections is due to an extremely local occurrence and ignorance of its habits on the part of collectors.

For easy identification, reference may be had to The Butterfly Book, by Dr. Holland, page 241, plate xxix, Figs. 19 and 20, where the upper and under sides are figured. The specimens I have seen show an orange-red dash on the costal edge of the primaries below extending from the base and gradually diminishing to finally disappear about opposite the stigma.

On some North American Hemiptera.

By DR. E. BERGROTH, Turtola, Finland.

Fam. REDUVIIDAE.

In 1872 Stål on good reasons united his genera *Doldina* and *Hygromystes*, but by some inadvertence called the genus in this comprehension *Hygromystes*, although the name *Doldina* is one year older.* As the genus was hitherto known only from Brazil, the two species here described are of geographical interest.

Doldina interjungens n. sp.

Testaceous, rather sparingly clothed with a white pilosity which is much shorter on the upper side and thicker on the apical part of the prosternum and the adjacent part of the head, abdomen piceous-testaceous with the lateral border pale testaceous. Head shorter than pronotum, first antennal joint passing apex of scutellum, second joint a little shorter than head. Pronotum half as long again as the humeral breadth, the posterior lobe very finely and thickly punctured, the longi-

* For Stål's "Rio Janeiro Hemiptera I" Lethierry & Severin give the wrong date, 1858. The work was published in 1860, as admitted by Stål himself.

tudinal median impression rather broad, the intrahumeral impression evanescent anteriorly, humeral angles armed with a short acute spine, disk unarmed. Scutellum slightly recurved at apex. Hemelytra (♀) not reaching middle of last dorsal segment, the prolonged exterior apical part of the corium almost hyaline at and before the apical angle, membrane subhyaline, its exterior basal cell passing apical angle of corium. Abdomen shortly spined at the apical angles of the first two segments. Hind femora reaching base of sixth abdominal segment. Length, ♀ 19 mm.

North Carolina (Roanoke Island, G. P. Engelhardt).

This very distinct species is described from a single specimen in de la Torre Bueno's collection. It is exactly intermediate in structure between the subgenera *Doldina* and *Hygromystes*, agreeing with the former in the unarmed disk of the posterior pronotal lobe, with the latter in the spinous humeral angles.

***Doldina praetermissa* n. sp.**

Testaceous, shortly pilose above, more longly so on the upper side of the head on the first two antennal joints, on the underside of the body, along the abdominal margin, and on the legs, head more or less infuscated on the sides, upper side of postocular part sometimes with two narrow ferruginous vittae behind the ocelli, venter sometimes with a sub-lateral brown vitta. Head shorter than pronotum, first joint of antennae slightly passing apex of scutellum, second joint as long as postocular part of head and eye together. Pronotum rather more than one-half longer than the width between the humeral angles, anterior lobe smooth, in fresh specimens with some subreticulated pubescent lines, posterior lobe unarmed, finely and thickly rugulose punctate with five shallow and rather narrow longitudinal furrows, the middle furrow being more distinct. Abdomen with a short spine at the apical angles of the first and second segments. Posterior femora reaching or nearly reaching the base of the sixth ventral segment. Length, ♀ 16-17 mm.

Florida (Charlotte Harbor, Mrs. A. T. Slosson); British Honduras (Belize, C. F. Baker).

Allied to *D. lauta* Stål, but it is smaller and the posterior lobe of the pronotum is somewhat differently sculptured with the median furrow narrower and less deep.

Of this species I have seen two specimens; the description is, of course, founded on both, and I must thus refrain from designating only one of them as "type." When an author

finds a species on two or more specimens it is incumbent on him, in describing the species, to examine and take into consideration all these specimens and he has no logical right to designate one specified specimen as type. They are all types and have all the same claim to be considered as such, unless the describer has expressly stated that certain specimens on such and such ground are less typical or that one sex is doubtfully conspecific with the other. If a subsequent author subdivides the species into two or more species, he is at liberty to choose any of the original specimens as types both for the old species and for the new ones, even if the first describer, for commercial or other reasons, has marked only one specimen as type. I have thought it necessary to put in this as an apology for refusing to fix one-specimen types, some of my correspondents having urged me to discriminate between "type" and "cotypes," a discrimination which seems to me to be unscientific and liable to promote careless describing. Cotype can in my opinion be used only as a synonym of type, indicating that a species has been founded on more than one specimen.

Castolus ferox Banks.

Mr. Banks kindly gave me specimens of his *Zelus ferox* from Arizona. It is no *Zelus* at all, but belongs to the genus *Castolus* Stål, being the first species of this genus found north of Mexico.

Fam. HENICOCEPHALIDAE.

Henicocephalus biceps Say.

There can be no doubt that the insect described by Say under the name *Reduvius biceps* is the same as *Hymenodectes culicis* Uhl., described 60 years later. Say's species does not seem to have been mentioned in the literature since it was described and is omitted even in all the catalogues (Lethierry & Severin, Uhler, Banks). I have before me only Say's original pamphlet printed in New-Harmony, Ind. (of which but two copies are said to exist in the United States and scarcely more in Europe) and I do not know if it be omitted also in

the "Complete Writings."* Say's type was from Pennsylvania and his description is pretty good, fully agreeing with my specimens. Hemipterists who for the first time saw a *Henicocephalus* have generally thought they had something quite unknown before them, no less than nine generic names having been bestowed on the genus in addition to one name given to the larva. It is interesting and worth remembering that Say, who described his species five years before Westwood founded the genus *Henicocephalus* and who was little inclined to propose new genera, placed the insect in *Reduvius*, between his *Reduvius acuminatus* (an *Oncerothelus*) and his *Reduvius insidiosus* (a *Triphleps*), thus not far from its true position. Although Say failed to recognize a new genus and family in his species he was so impressed with the singular structure of its head that he gave his insect a specific name exactly corresponding to the generic name (*Dicephalus*) under which the genus was redescribed by W. F. Kirby.

Fam. COREIDAE.

Harmostes bruesi n. sp.

Above whitish testaceous, head somewhat darker, pronotum (except apical third and lateral borders), clavus, and interior part of corium pink-colored, underside of body pale greenish testaceous (in the live insect probably pure green). Head finely and thickly punctured with an impressed line reaching from the base of the head to the base of the clypeus and a much shorter linear impression before each ocellus and between the ocellus and the eye, apical process scarcely reaching the middle of the first antennal joint, rostrum reaching the hind coxae, pale testaceous with black tips, antennae reddish testaceous, first joint incrassated, finely granulated, its exterior margin straight, interior margin convex, second and third joints linear, subequal in length, each as long as the head and a little less than twice the length of the first

[*The description of *Reduvius biceps* is included in Le Conte's "Complete Writings of Thomas Say," vol. i, p. 356, where it is found in the reprint of a paper entitled "Descriptions of new species of Heteropterous Hemiptera of North America. New Harmony, Indiana, December, 1831." A footnote by Le Conte states, "This memoir is taken from a reprint by Dr. Asa Fitch, in the Transactions of the New York State Agricultural Society for 1857; I have never seen an original copy of it and can consequently give only the paging of the reprint." Neither the library of the Academy of Natural Sciences of Philadelphia nor that of the American Philosophical Society in the same city possesses a copy of the original edition of 1831.—Ed.]

joint, fourth joint narrowly fusiform, a little longer than first. Pronotum densely punctate with a low pale median ridge not quite reaching the apical margin and with four impressions placed in a transverse row before the middle, the interior impressions situated close to the median keel, lateral margins smooth, moderately subangularly sinuate in the middle, humeral angles rectangular, very narrowly rounded, intrahumeral impressions distinct. Scutellum densely punctate with a faint median keel not reaching the apex. Metasternum strongly grooved in the middle. All pleurae densely punctulate. Corium and clavus strongly and rather thickly punctate, costal margins of coria parallel from the base through less than a third their length, then slightly amplified, membrane hyaline, passing apex of abdomen by half its length. Abdomen beneath strongly sulcated from its base to the apex of the third segment, male genital segment arcuately sinuate at apex with three appendages protruding from the interior, the median one very short, conical, the lateral ones knife-shaped, turning their convex margin inwards, whitish with the apex narrowly infuscated. Legs testaceous, hind femora passing apex of abdomen, their incrassated part tinged with reddish brown, the spines white, the larger ones with the extreme tip blackish. Length, ♂ 6.8 mm., with membrane 8 mm.

Texas (C. T. Brues).

This species cannot be easily mistaken for any other North American species and is also well distinguished from the neotropical forms. In structure it is intermediate between Stål's divisions *a* and *aa*, having non-serrulate pronotal lateral margins, but a deep basal ventral furrow. It possibly comes nearest to *H. bicolor* Dist., but Distant says nothing about the presence or absence of the ventral groove in any of the species described by him.

This insect was among some Texan Hemiptera kindly presented to me by Mr. Brues. The label shows no precise locality, only the date 3-23-00.†

Honors to Entomologists.

Professors John Henry Comstock, of Cornell University, and Clarence E. McClung, of the University of Pennsylvania, and Assistant Surgeon General William C. Gorgas, U. S. A., were elected members of the American Philosophical Society at Philadelphia, on April 19. Professor George H. Parker, of Harvard University, was elected a member of the National Academy of Sciences, at Washington, April 22-24.

[†Mr. Brues has kindly informed us that: "The bug dated 3-23-'00 was from Austin, Texas, I am positive, as I collected there at that date."—Ed.]

New Species of *Macrogonus* (Coleop.).

By F. C. BOWDITCH, Boston, Mass.

Two new species of *Macrogonus* should be added to the list, one of which is from New Guinea and the largest yet described; types of both are in my collection.

Macrogonus atripennis nov. sp.

Rufous, head and thorax more or less aenescent the jaws, antennae, except the first joint, the apex of the tibiae, the tarsi and elytra and first four segments of the abdomen blue black.

Head with a broad triangular depression in front, the rear angle continued over the vertex in a well marked groove, surface finely and rather regularly punctured, antennae reaching a little beyond the middle of the body, pubescent (except the scope), 2nd joint short tubular, 3d about one half longer and 4th distinctly longer than the third, 5th, 6th and 7th longest of all; thorax with the lateral middle angle well developed, stout and acute, the four corners angulate, setose, two well marked foveae, one on either side back of the middle, basal depression elongate, well marked, the entire surface shining, sparsely punctulate, rear rounded and faintly margined, elytra parallel, shining, surface everywhere obsoletely wrinkled with about 10 rows of very fine punctures, regularly placed becoming obsolete at the rear and scattered punctures in the intervals, shoulders prominent, each elytron with two deep foveae placed as usual in the genus, subbasal median, and median sublateral; the body below especially the dark part is strongly punctate.

Type—Richmond River, New South Wales, 2 examples; length 10 mm.

Very much resembles in color *Macrolema longicornis* Jac.

Macrogonus aenescens nov. sp.

Head rufous, aeneous, vertex dark metallic green, antennae reaching below the middle of the body, five lower joints purple, remainder dull, submetallic, all except the scope pubescent, thorax rufous, base and middle suffused aeneous bronze, extreme basal edge purple, scutel rufous iridescent, elytra polished, shining, bronzed, extreme thickened edge touched with purple, body beneath and femora rufous, with extreme tip of latter and tibiae and tarsi dark submetallic purplish. Length 15 mm.

Head has the labrum slightly darkened and with a broad triangular depression on the front between the eyes (as in *submetallicus* Jac.) and a deep elongate fovea on the vertex, punctures thick near and between the eyes, becoming sparse at the top and rear of the vertex.

Thorax with scattered foveate and finer punctures crowded at the sides behind and a deep fovea on each side and a well-marked basal depression, also a faint double depression anteriorly, the sides at the middle show a broad very stout upcurved, obtuse tooth and all four corners well developed angles, the rear setose; a glance of green shows here and there on the aeneous part of the thorax. Elytra slightly compressed at the middle, parallel, bright metallic, bronze, with 2 foveate depressions on each side, a subbasal, antemedian and a sublateral, median; impressed with large punctures arranged in nearly regular rows up to and including the fifth, after which they are broken and confused about the middle, the confusion coinciding with the two foveate depressions. The rufous inside shows here and there faint touches of greenish color.

Type—Maroka, British New Guinea, 3500 ft. X, '95 (Anthony), 1 example.

This is the first of the genus to be recorded from New Guinea, the others coming from Queensland.

M. submetallicus Jac. (types in my coll.) shows thoracic angles before and behind as above described, though not as large, and the elytra show similar depressions, though not as deep, and the elytral punctuation is very much less marked in *submetallicus* than in *aenescens*.

Synoptical Table of the North American Species of the Dipterous Genus *Sympycnus*, with the description of a new Species.

By M. C. VAN DUZEE, Buffalo, New York.

Two species of *Sympycnus* came to me determined as *Neurigona* while I was working up that genus; one I am describing below as *S. clavatus*, and the other was our common eastern form *S. lineatus* Loew. The following characters separate *Sympycnus* from related genera.

Eyes of the male contiguous below the antennae or nearly so; first joint of the antennae without hairs above, and the second joint without a thumb-like projection along the inner side of the third joint. Abdomen of the male with six visible segments besides the hypopygium; hypopygium short, not extending forward under the venter, and with small append-

ages (in several species the appendages are not visible). First joint of hind tarsus of the male longer than the second; hind tarsi shorter than their tibiae, and the first joint without large bristles above. Wings with the second vein almost straight; third and fourth veins slightly convergent; fourth vein ending in or before the apex of the wing. Dorsum of the thorax convex on the posterior end, without a flattened space before the scutellum. (This last character must be used with caution as there is a slight concavity before the scutellum, at least in some species, which leads to placing species of this genus in *Neurigona*, from which they are easily separated by the six-segmented abdomen.)

In all the species I have seen the hind tibiae are more or less enlarged at the tip.

Table of Males.

- 1 Hypopygium large, making up nearly half the length of the abdomen. Antennae yellow, third joint black. Thorax dark green above. (Grenada.).....*frater* Ald.
Hypopygium smaller 2
- 2 Hypopygium very asymmetrical..... 3
Hypopygium symmetrical 5
- 3 Antennae yellow; first joint of fore tarsi with three or four minute but stout black bristles below. (Mexico.).....*coralis* Ald.
Antennae black; fifth joint of fore tarsi with a projection below (St. Vincent.) 4
- 4 Fore tibiae with a row of stubby bristles.....*similis* Ald.
Fore tibiae without a row of stubby bristles.....*falco* Ald.
- 5 Fourth vein ending in the tip of the wing..... 7
Fourth vein ending before the tip of the wing..... 6
- 6 Antennae black; first joint of hind tarsi longer than the second,
first joint of hind tarsi a little shorter than the second, and the third a little shorter than the fourth. (Sitka.)
tertianus Loew.
Antennae black; first joint of hind tarsi longer than the second, and the third longer than the fourth. (Wyoming.)
marcidus Wheeler
- 7 Pulvilli of fore tarsi not enlarged; first joint of hind tarsi shorter than the second, at least in *lineatus*..... 8
Pulvilli of fore tarsi enlarged; first and second joints of hind tarsi nearly equal, or the first longest..... 9

- 8 Dorsum of the thorax bluish-green, without distinct vittae; front purple in the middle. (Mexico.).....*angustipennis* Ald.
Dorsum brownish with dark vittae; front black or greenish black; hypopygium with long appendages. (Eastern species.)
lineatus Loew.
- 9 Fourth and fifth joints of middle tarsi dilated and fringed with black bristles; second joint of hind tarsi with a few long bristles on its upper surface near the tip. (Washington.)
pugil Wheeler
- Middle tarsi plain; second joint of hind tarsi without long bristles 10
- 10 Hind tibiae with a wide black band at tip; hind metatarsi with basal half whitish, apical half black, and longer than the second joint; hypopygium with distinct appendages. (New Mexico.)*clavatus*, n. sp.
- Tips of hind tibiae and all of hind tarsi black; first and second joints of hind tarsi nearly equal; hypopygium without distinct appendages 11
- 11 Dorsum of the thorax gray, with the bristles arising from brown spots and with a brown line down the middle; bases of the abdominal segments purplish bronze; fore femora all yellow (Mexico.)*veripes* Ald.
Dorsum dark blackish green; bases of the abdominal segments cupreous; basal half or more of fore femora black. (California.)*cuprinus* Wheeler

***Sympycnus clavatus* n. sp.**

Male.—Length 2.5 mm. Eyes contiguous on the face, leaving only a small triangle below the antennae, which is greenish-black and covered with white pollen; palpi small, with silvery-white pollen; front and occiput greenish-black, with white pollen: two basal joints of the antennae yellow, third joint with a blunt point, brown; arista brown; cilia of the lower orbit white, a few of the upper cilia black. Dorsum of the thorax dark, rather dull green, scutellum and metanotum concolorous, pleurae more blackish; all rather thickly covered with white pollen; humeri and a spot at the insertion of the wings yellowish; halteres yellow. Abdomen yellow, the first segment infuscated, second and third with poorly defined black bands at the incisures which are more or less connected along the center of the dorsum, fourth except at the base, and the fifth and sixth altogether greenish-black; hypopygium of the same blackish color, and with distinct appendages (Fig. 1); venter yellow; hairs of the abdomen including the long bristles on the posterior margin of the first segment yellow. Fore and middle tarsi with the two last joints blackened; pulvilli of fore pair slightly enlarged. Legs and coxae pale yellow; hairs and bristles of fore and

middle coxae whitish; the long bristle on the outer surface of the hind coxae yellow, or yellowish-brown in some lights; tops of hind femora brownish; hind tibiae incrassated towards the tip, tips with a



FIG. 1.

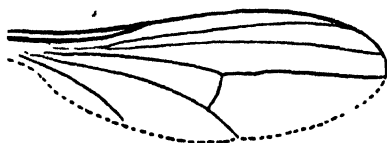


FIG. 2.

1, Hypopygium and 2, Wing, *Sympycnus clavatus* n. sp.

sharply-defined black band which is as wide as the second tarsal joint is long; hind tarsi scarcely half as long as their tibiae, black with the basal half of the first joint whitish, first joint longer than the second, the following joints regularly decreasing in length; fore and middle tarsi about the same length as their tibiae, and with the last two joints infuscated; fore metatarsi about one-half as long as their tibiae; middle metatarsi about one-third the length of their tibiae. Wings grayish hyaline, narrowed at base, and with the anal angle nearly obsolete (Fig. 2), last section of fourth vein nearly straight, and only slightly approaching the third towards the tip, ending in the apex of the wing.

Female.—One female that agrees with these males in the coloration of the legs and antennae in having white hairs and bristles on the fore and middle coxae, and a yellow bristle on the hind coxae, I am placing as the female of this species. The dorsum of the thorax is brown covered with gray pollen, leaving five vittae, the central one being the most sharply defined and the outer pair the most poorly defined. The abdomen is altogether brown except the venter which is yellowish. Wings with the anal angle more prominent than in the male, and more tinged with brown; the fourth vein ends in the tip of the wing. Length 3.5 mm.

Described from two males and one female from New Mexico. The males are in the collection of the American Entomological Society, and were taken at Alamogorda, N. M., in May. The female is in the National Museum and was taken at Las Vegas, N. M., on August 9th. Am. Ent. Soc. Type No. 5259.

Note.—The female of this species has the prescutellar depression very distinct, in the male it is not so conspicuous.

This species is easily separated from all others of the genus by the coloration of the hind feet.

A New Noctuid (Lepid.).

By the late JOHN B. SMITH, Sc.D.*

Mamestra gertana n. sp.

Dull ashen gray without marked contrasts. Head a little darker in front; collar with a distinct black median line; disc of patagia paler gray, the borders more or less margined with black. Primaries with all the markings fairly well-defined, but none of them contrasting or sharply outlined. Basal line geminate, black, broken, incurved toward base on the median vein. T. a. line geminate, well removed from base, outwardly oblique and a little outcurved. Outer portion of line usually best marked and a little outcurved on the interspaces; inner line narrower and less well-defined, tending to become lost. T. p. line geminate, blackish, with a moderate outcurve over the cell and a deep incurve below, greatly narrowing the median space; but this varies in the specimens. The inner portion of line is usually continuous and a little marked on the veins; the outer portion tends to become punctiform and to become marked on the veins by white dots set in a black streak. S. t. line narrow, irregular, pale, often marked only by the difference in shade between terminal and s. t. spaces; sometimes a little outwardly edged with black or marked with yellowish scales, while usually there is a little yellowish preceding mark opposite anal angle and a blackish streak beyond that to outer margin. A series of distinct black terminal lunules at the base of the long and slightly waved fringes. Usually the median space is the darkest and the s. t. space the palest portion of the wing, but in many cases the median area is only a little darker and the rest of the wing uniform in tint. Claviform broad, concolorous, outlined in black, extending

* EDITOR ENTOMOLOGICAL NEWS:

Shortly after Dr. Smith's death I found the enclosed description of *Mamestra gertana*, n. sp., in his desk, which he had written during the summer of 1911, and was no doubt holding it until he had described some other specimens. Dr. Smith's illness, of course, prevented him from doing any systematic work, although he was able to attend to routine and office work until a few days before his death.

I did not send the description to you immediately as I feared that Dr. Barnes, who had described a great many new species, might in the meantime have described this same species. Dr. Barnes was here recently to look over the collections and he assured me that he had not described anything like this species, and that I should send the description to you for publication.

Very truly yours,

AUGUSTA MESKE.

New Brunswick, N. Jersey, March 11, 1913.

across the median space or connected with the t. p. line by a short spur. Orbicular large, oval, oblique, gray with a dusky central shade, fairly well defined. Reniform upright, rather long kidney-shaped, gray, with a narrow dusky center, margins fairly well defined. Secondaries smoky blackish in both sexes. Beneath, dull smoky brown, secondaries paler and more powdery, both wings with more or less obvious extra-median lines and discal dots.

Expands 1.00-1.15 inches (25-29 mm.)

Habitat—San Diego, California, in March.

Thirty-three males and seven females are at hand for comparison, received through Mr. H. H. Brehme. The species runs toward the smaller size, the largest example representing a single female conspicuous in the series. As a whole the species resembles an undersized *cuneata* with the contrasts out and the maculation slightly modified. Six of the specimens before me have no trace of yellow scales on the s. t. line, and in most of the others there are only a few opposite the anal angle. For comparison I have over 20 examples of *cuneata*, ranging from San Francisco, California, northward into British Columbia and eastward into the Mountains of Colorado.

The antennae of male are barely ciliate, and the dorsal tuftings on abdomen are complete.

The Genus *Parodinia* Coquillett (Geomyzidae, Dipt.).

By J. R. MALLOCH, Bureau of Entomology, U. S. Department of Agriculture.*

In the course of some work I have in hand, revising the species in Agromyzidae, I found specimens of this genus standing under the specific names *cinerea* Coquillett, and *costalis* Coquillett, amongst the Milichinae. It was at once quite evident that they did not belong there and were just as evidently true Geomyzidae. I should have transferred them to their proper place without further remark, but for the fact that the specimens standing as *costalis* represent two distinct species, the description of one of which is here given.

* Published by permission of Chief of Bureau.

The genus *Parodinia* is closely allied to *Zagonia* Coquillett, and possibly could be ranked as synonymous with it, but with our very limited knowledge of this family I do not consider it advisable to sink the latter at present. The only difference between them lies in the much higher cheeks of *Zagonia*, which has the height of cheek at least equal to that of eye, whereas *Parodinia* has the eye very distinctly higher than the height of cheek. In Agromyzinae I do not consider this character as of more than specific value, but I apprehend no disadvantages from the retention of the genus *Zagonia*.

PARODINIA Coquillett.

Syn.—*Parodinia* Coquillett, Jour. N. Y. Ent. Soc., Vol. 10, 1902, p. 186.

Generic characters: Two pairs of backwardly directed fronto-orbital bristles; post-vertical bristles cruciate; vibrissae distinctly differentiated; proboscis and palpi normal; mesopleura with at least one strong bristle; two sternopleural bristles; five pairs of dorso-centrals on mesonotum; scutellum four-bristled; tibiae with preapical bristle present; wings with subcostal vein indistinct but complete, the costa with distinct short spines, in addition to the usual hairs, and the posterior cross vein at distinctly beyond middle of wing.

Synopsis of Species.

- 1 Cheeks at least half as high as eye; fore femur yellow
.....*cinerea* Coquillett
Cheeks much less than half as high as eye; fore femur blackened 2
- 2 Wings browned, most distinctly so along costa.....*costalis* Coquillett
Wings clear.....*claripennis*, new species

Parodinia cinerea Coquillett.

Syn.: *Parodinia cinerea* Coquillett, Jour. N. Y. Ent. Soc., Vol. 10, 1902, p. 186.

This species may be known from its allies by the black third antennal joint, the cheeks being about half as high as eye, and the legs being entirely yellow, except the tarsi, which are browned. This species, which is the type of the genus, was described by Coquillett from three specimens, taken by himself, at Los Angeles, California.

***Parodinia costalis* Coquillett.**

Syn.: *Rhinoessa costalis* Coquillett, Proc. Wash. Acad. Sci., Vol. 3, 1901, p. 378.

Originally described from Galapagos Islands, and afterwards recorded from Arizona by Coquillett (Jour. N. Y. Ent. Soc., Vol. 10, 1902, p. 187), which record refers to the specimens described below. To Coquillett's original description of *costalis* it is necessary to add that there are five, not four, pairs of dorso-central bristles. There is only one specimen in the National Museum collection, which is not in very good condition.

***Parodinia claripennis* new species.**

Male.—Opaque gray; anterior half of frons, antennae, except upper surface of third joint, face, cheeks, proboscis and palpi, legs, except fore femora, and halteres yellow.

Bristling of frons normal; antennae of moderate size, third joint distinctly longer than broad; arista thickened at base, almost bare; cheeks about one-sixth as high as eye, marginal bristles of moderate strength, vibrissa differentiated. Mesonotum with two rather faint yellowish stripes close to, and between, the rows of dorso-centrals; about four irregular rows of discal setulae between dorso-centrals; the pair of bristles between the posterior pair of dorso-centrals distinct; pleurae shining on lower portions, and with yellowish pollinosity on upper half. Abdomen slightly shining; all segments with sparse setulae on the surfaces and stronger post-marginal bristles. Legs with fore femora blackened or browned, and sometimes the apices of fore tibiae darkened also; fore femora with 4 to 5 distinct bristles on apical half of postero-dorsal and postero-ventral surfaces; mid and hind femora not so distinctly bristled; all tibiae with distinct preapical bristle. Wings clear; veins brownish yellow; second vein slightly undulating; veins 2-3 very distinctly divergent at apices, 3-4 distinctly though slightly convergent. Length, 2-2½ mm.

Female similar in color, etc., to male.

Type: Cat. No. 15,557, U. S. N. M. Locality: Williams, Arizona (H. S. Barber).

Paratypes: Williams, Bright Angel, and Flagstaff, Arizona, same collector; eight specimens.

This species differs from *costalis* Coquillett, in having the wings clear, the arista almost bare, and in being larger, as well as in its much paler color. It is unfortunate that the type of *costalis* is in such poor condition that the position of the bristles cannot be definitely ascertained.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., JUNE, 1913.

COLOR NOMENCLATURE.

One of the crying needs of descriptive entomological, and in fact, of all zoological, work has been that of a standardization of colors—the necessity for a uniform set of terms having a fixed chromatic value which could form a basis for color descriptions and comparisons. This need has been so imperative with the working ornithologists that one of the leading members of that body of scientific men, fully realizing the necessity, for years has made a special study of the subject, publishing over twenty-six years ago a Nomenclature of Colors, and now after "a thorough study of the subject from every standpoint" has presented to us a monumental set of standards of colors and color names.* The importance of this work cannot be overestimated to the entomological student who has to deal with the fine definition of color tones, as in the differentiation of closely related forms of groups in which

* Color Standards and Color Nomenclature. By Robert Ridgway, Curator of the Division of Birds, United States National Museum. With Fifty-three Colored Plates and Eleven Hundred and Fifteen Named Colors. Washington, D. C. 1912. Published by the Author. (Price, \$8.00.)

color tone is diagnostic, a condition where some absolutely fixed standard is imperative, the absence of which has been a fruitful source of misunderstanding and ambiguity. With the student of color variation and protective coloration the need of an exact system of expressing color value has been just as decided and the appearance of Mr. Ridgway's "Standards" should receive from all entomologists the attention it so fully deserves.

The method of treatment is thoroughly scientific and the values are obtained by mathematically determined mixtures. The thirty-six principal hues are based on the solar spectrum, each hue being graded in a vertical scale with fixed proportions of white and black. The same set of color tones are repeated with increasing admixtures of neutral gray, first with thirty-two per cent., second with fifty-eight per cent., third with seventy-seven per cent., and fourth with ninety per cent. By a very simple method of notation it is very easy to follow a single hue and its numerous tones through all the steps from purity to greatest paleness on the one hand and to the point of greatest divergence in neutralization on the other. This is a very important matter to the student who is dealing with recessive and intensive color patterns, the exact tone of which is far harder to express than the form of the pattern itself, in fact practically impossible to definitely express without a system similar to that employed by Mr. Ridgway.

The technique of the work is excellent, each of the eleven hundred and fifteen tones having been colored in large sheets at one time with the same mixture of pigment to insure absolute uniformity, the sheets being cut up and the squares placed in their respective positions on the plates.

Entomologists can rejoice with their ornithological brethren in the appearance of this noteworthy and epoch-making work, which is a monument to the industry and persistence of the author. The utilization of these color terms will simplify the perplexities of modern color descriptions and once used the value of the "Standards" will be fully recognized.

J. A. G. R.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Cystineura Amymone (Lepid.).

This little butterfly, one of seven species inhabiting Central and South America, has a wider northern range than any of the others. It is one of our rare species, but can be found by the careful collector almost any season. In October, 1905, while collecting in what is now Ponotoc county, Oklahoma, I saw an unfamiliar butterfly, and succeeded in capturing it. It was a specimen of the species *Cystineura amyamone*. At the time, I thought it was a straggler that had been driven north by some storm and stranded here as frequently happens to some of our southern species. But while collecting in the western part of the state in the summer of 1907, I found quite a large colony of them near Cordell, Washita county. I took specimens over a range of about eight or ten miles in extent. They were permanently located and were breeding. Again in the autumn of 1911, I saw a specimen near Blackwell, Oklahoma.

This little butterfly is a weak flyer and is always found in places protected from strong winds, such as open wooded tracts, streams, orchards and groves.—ED. L. REED, B. A., Oklahoma State Baptist College, Blackwell, Okla.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues, which are generally dated the year previous.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

4—The Canadian Entomologist. 6—Journal, New York Entomological Society. 7—U. S. Department of Agriculture, Bureau of Entomology. 10—Nature, London. 21—The Entomologist's Record, London. 22—Zoologischer Anzeiger, Leipzig. 35—Annales, Societe Entomologique de Belgique. 50—Proceedings of

the U. S. National Museum. 62—Handlingar, Konglige Svenska Vetenskaps-Akademiens, Stockholm. 64—Annalen, K. k. Naturhistorischen Hofmuseums, Wien. 66—Die Naturwissenschaften, Berlin. 73—Archives, Zoologie Experimentale et Generale, Paris. 87—Bulletin, Societe Entomologique de France, Paris. 102—Proceedings of the Entomological Society of Washington. 119—Archiv fur Naturgeschichte, Berlin. 143—Ohio Naturalist. 152—California Agricultural Experiment Station, Berkeley. 175—Aus der Natur, Berlin. 180—Annals, Entomological Society of America. 190—Deutsche Entomologische Zeitschrift "Iris," Dresden. 191—Natur, Munchen. 198—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. 216—Entomologische Zeitschrift, Frankfurt a. M. 226—Transactions, Academy of Sciences of St. Louis. 234—Records, Indian Museum, Calcutta. 240—Maine Agricultural Experiment Station, Orono. 365—Collections Zoologiques du Baron Edm. de Selys Longchamps, Bruxelles. 369—Entomologische Mitteilungen, Berlin-Dahlem. 395—Revue Mensuelle de la Societe Entomologique Namuroise, Namur. 410—Journal of the Washington Academy of Sciences. 411—Bulletin of the Brooklyn Entomological Society. 420—Insecutor Inscitiae Menstruus: A monthly journal of entomology, Washington, D. C. 424—Bulletin de la Societe d'Histoire Naturelle de Metz. 425—Abhandlungen aus dem Gebiete der Naturwissenschaften... Verein in Hamburg. 426—Brasilianischen Rundschau, Rio de Janeiro.

GENERAL SUBJECT. Blanchard, F.—Obituary, 6, xxi, 69-71. Bryant, H. C.—The economic value of the western meadowlark in California, 152, Bul. 236. Calvert, P. P.—An entomologist in Costa Rica, 180, vi, 1-4. Dow, R. P.—The makers of Coleopterous species, 411, viii, 51-54. Eckstein, K.—Biologische beobachtungen im walde, 175, ix, 442-451. Enderlein, G.—Die insekten des Antarkto-Archiplatea-Gebietes (Feuerland, Falklands Inseln, Sud Georgien), 62, xlviii, No. 3, 169 pp. Escherich, K.—Die angewandte entomologie in den Vereinigten Staaten, Berlin, Paul Parey, 1913, 196 pp. Gravely, F. H.—Mimicry of a mutillid by a spider, 234, vii, 87. Holloway, T. E.—Insects liable to dissemination in shipments of sugar cane, 7, Circ. 165. Johannsen, O. A.—Insect notes for 1912, 240, Bul. 207. Lambillion, L. J.—Faut-il reglementer les principes qui regissent actuellement l'entomologie? 395, 1913, 32-33. Lutz, F. E.—Factors in aquatic environments, 6, xxi, 1-4. Plate, L.—Vererbungslehre, mit besonderer berucksichtigung des menschen, fur studierende, arzte und zuchter, 519 pp, Leipzig, 1913. Standfuss, R.—Mitteilungen aus eigenen erfahrungen, betreffend die preparatation von eiern, larven, raupen und puppen von insekten, 216, xxvii, 1-3 (cont.). Stocking, R. T.—(See under Coleoptera.)

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A PARTIAL REVIEW.

In looking over some recent literature received at the Academy of Natural Sciences, of Philadelphia, I was especially interested in a volume of the "*Fauna of British India, including Ceylon and Burma, published under the Authority of the Secretary for India in Council. Diptera Nematocera (excluding Chironomidae and Culicidae)*". By E. Brunetti."

This faunal work is rather extensive, comprising a series of which thirty volumes have been published to date, including twenty treating of entomology, and is a credit to its authors and editors. The volume or part in question is the first one of the series to be devoted to Diptera, and it is easy to predict, that if the following issues upon this order are of the same character, the dipterological students of India will have an excellent treatise on their fauna.

A monograph of the Diptera of North America on these lines would

be a work well worthy of the best abilities of its authors and editors. Surely the natural history of India is not nearly so well known as that of North America, and yet, here is this "Fauna of British India" coming out, of which entomology is already the major portion. Of course, such a work is incomplete. Should we wait until such a time when it would be complete? No; for as the author of this volume says, "many new species . . . will with certainty be discovered, but it seems reasonable to assume that for some little time to come the wants of the . . . student in the groups monographed . . . will be tolerably well met in these pages."

The preface, glossary and introduction given in this part, are alone a mine of information, and should prove of interest to every dipterist, especially the junior students. It is these pages that most interest me and prompt me to write this notice. Anyone, reading over the introduction can, of course, see conservative England in the author's methods and ideas, but he has shown the independence naturally developed from being associated with persons and things of a place far away from the direct influences of the mother country. Such an author is compelled to rely more upon himself, and his work is, on that account, of more interest, but will cause more criticisms, both just and unjust. As to the work in question, I have no criticisms of much import to make, partly because I am not considering the work in its entirety. Not being well versed in the Nematocera, I will not attempt to review the systematic part, but confine myself mainly to the introduction. Thus my title, "A Partial Review."

This introduction is practically a manual of dipterological taxonomy, although "a general introduction to the whole order . . . is not contemplated . . . in this volume." I find his remarks on collecting and mounting of the most interest, especially the methods of collecting, which will prove of value to many of us Americans. I agree with him, in most respects, as to his remarks on the mounting, especially as to the objection to gluing specimens on slips of cards. Every specimen, both large and small, should be pinned, and he rightly recommends pinning through the pleura obliquely instead of through the dorsum. His recommendations in this respect, will not appeal to those desiring an artistically arranged collection, but the sooner the collector and student recognizes the advantages of these methods and adopts them, as well as that of keeping the specimens dry and clean, the more rapidly will the study of this order progress. I should think that even the glossary and introduction alone, of this work, if published in a pamphlet form, would be a useful guide to collectors and students who desire to have material which will not be thrown away when it comes to be worked up for determinations.

There is one point I happen to notice wherein the author is decidedly wrong. It is in his use and explanation of the term "prae furca,"

of which he says that Mr. Verrall uses the term for that portion of the second vein between its origin and the origin of the third vein, but that in the present work the term is used in Osten Sacken's sense, who, he says, applies it to the whole of the second vein as far as the fork, which is beyond the origin of the third vein. In fact, Verrall uses the term in exactly Osten Sacken's sense, viz.: "the portion of the second vein between its origin and the emission of the third longitudinal vein." The portion beyond, to the fork, Osten Sacken terms the "petiole of the first submarginal cell." In the preface the author explains his use and understanding of the term "cotype." It is to be regretted that he used this term at all for his species, but as he explains his meaning of the term, there need be no misunderstanding. He is wrongly under the impression that his term "neotype" had never been proposed before, but he fortunately uses it in practically the same sense as originally proposed by Cossman.* The insertion of text figures illustrating the principal characters of the species described, is an excellent feature, as it is in any work, but could be used less sparingly here to good advantage, although the work is fairly well accompanied with good plates. In his treatment of some of the nomenclatorial situations, he has shown some of his independence and conservativeness, and will no doubt be criticized in this respect by some of his colleagues. On the whole, I think the style of the work is excellent, and I trust the subsequent issues, treating of Diptera, will be of like character.—E. T. CRESSON, JR.

THE MONTHLY BULLETIN OF THE STATE COMMISSION OF HORTICULTURE, Sacramento, California, is a journal which, since its initiation last year, has been nearly replete with entomological articles. The latest issue, comprising Nos. 1 and 2 of volume ii, contains more than 350 pages. It bears the title, "The Injurious and Beneficial Insects of California," by E. O. Essig. The number is profusely illustrated from drawings and photographs, many of which are by the author and are for the first time published, or, have appeared only in one or two of the western journals. This issue should certainly prove of value, not only to the fruit-growers of California, but also to those of other states, at least on account of the excellent illustrations which have not heretofore appeared in the literature.—E. T. C. JR.

THE ENTOMOLOGIST'S LOG-BOOK AND DICTIONARY OF THE LIFE HISTORIES AND FOOD PLANTS OF THE BRITISH MACRO-LEPIDOPTERA, giving many thousands of facts and data connected with the appearance of the ova, larvae, pupae and imagines; methods of capture; habitats; food plants; authorities; synonyms; etc., in Latin and English throughout, and interleaved for private notes. By ALFRED GEORGE SCORER, Fellow of the Entomological Society; member of the Royal Agricultural

* *Essais de Paleoconchologie comparée*, 1896, pp. 2, 3.

College, Cirencester; Professional Associate of the Surveyors' Institution, etc. London: George Routledge & Sons, Ltd., \$3.00 net. This work of 374 pages should prove invaluable for the student of British Lepidoptera who wishes to do more than gather together a collection and who desires a knowledge of the life history and habits of the species, or wishes to add to the great amount of knowledge already accumulated. It also contains many notes of value to the collector. It has a vast amount of useful information and we trust it may meet with the appreciation it deserves.—H. S.

CONTRIBUTIONS TO THE NATURAL HISTORY OF THE LEPIDOPTERA OF NORTH AMERICA, Vol. 2, No. 1. Illustrations of Rare and Typical Lepidoptera. By WILLIAM BARNES, B. S., M. D., and J. H. McDUNNOUGH, ^OH.D.—Plate one figures and differentiates *Melitaea alma* Streck., and *M. fulvia* Edw. *Megathymus stephensi* Skinner, is also figured. The remaining twenty plates figure Heterocera, many of the illustrations representing various kinds of type and typical material.

Vol. 2, No. 2.—This is an exceedingly valuable revision of the North American species of the Liparid genus *Olcne*. Descriptions, notes, etc., and seven plates figuring the species are given. The half-tones in this part are much better than some in previous issues of the Contributions.

Vol. 2, No. 3.—The first seven pages are devoted to diurnals and some new varieties of *Argynnis* are described, and also *Chlorippe clyton subpallida*, a new subspecies from Arizona. Observations are given in regard to other species or forms of this genus, and opinions expressed thereon. The type of *cocles*, which the authors have not seen, is in the collection of the Academy of Natural Sciences, of Philadelphia. A new *Copacodes*, from Texas, is described under the name *rayata*. The remainder of the number is taken up with descriptions of new moths. Two plates are devoted to butterflies and seven to moths. We hope the authors may be able to continue these valuable publications for a long time to come.—HENRY SKINNER.

Doings of Societies.

ENTOMOLOGICAL SECTION, ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

Meeting of January 23rd, 1913. Mr. Philip Laurent, Director, presided. Seven persons were present.

Dr. Calvert described a collecting trip he had made with Mr. K. J. Morton, at Loch Rannoch, in the Highlands of

Scotland, last July, in search of *Somatochlora arctica*. Two specimens were seen and one captured. Some Tabanids, a crane fly and a species of *Anthomyia* were also taken; the latter was very annoying. The specimens were presented to the Section. He also donated two specimens of an undetermined Lampyrid larva from Pennsylvania.

Mr. Hornig reported finding many larvae of an *Anthrenus* among the egg masses of the Tussock moth. Dr. Calvert referred to the many moultings of *Trogoderma tarsale*. Mr. Liebeck mentioned putting some larvae of *Anthrenus* in an empty cartridge shell which was then tightly closed. A long time after, upon opening it, he found nothing but shed larval skins.

Dr. Calvert reported having reared a lot of *Culex* larvae and they disclosed about equal numbers as to sex.

Dr. Skinner compared the State of New Jersey with that of Pennsylvania in regard to the distribution of butterflies and said there was a number of species found in New Jersey that were either absent from Pennsylvania or more or less rare. The following species illustrate this: *Phyciodes nycteis, batesi, Junonia coenia, Debia portlandia, Libythea bachmani, Thecla halesus, m-album, favonius, liparops, damon, augustus, irus, niphon, Chrysophanus epixanthe, Callidryas eubule, Terias nicippe, Pamphila, sassacus, metea, attalus, mystic, accius, maculata, ocola, panoquin, aaroni, hianna, dion, bimacula, titellius, viator, Amblyscirtes vialis, Thanaos petronius*.

Meeting of March 27th, 1913, Mr. Laurent in the chair. Twelve persons were present.

Mr. Kotinsky said he left Hawaii over three years ago and remarked that in some particulars the islands put him in mind of our own country. He described the mountain ranges and said the lowlands were totally devoid of native fauna and flora, the animals and plants now being of foreign origin. He referred to the hilo grass as being very destructive to other plant life. Insect life is abundant but species are not numerous, *Pyrameis tammeamea* being the most brilliantly colored

insect. Coleoptera are numerous but inconspicuous. Coccidae are also numerous, but there are probably no native species. The temperature ranges from 58 to 84 F. and it is cool and pleasant most months in the year. Hurricanes are disagreeable as is also the intense sunlight. The introduction and spread of lantana was mentioned. It soon became a pest and was checked by insect life. A description was given of the leaf-hopper pest and how it was checked.

Dr. Calvert referred to the fact that a large percentage of the Carabidae of the Hawaiian Islands were flightless and this also applies to other oceanic islands. Mr. Rehn said *Schistocerca vaga* on Clarion Island has wings only two thirds as long as those found on the mainland.

Dr. Calvert alluded to the work he has been carrying on in relation to fossil dragon-flies in comparison with living species. The very early remains of the Carboniferous period were compared with recent forms and the differences pointed out. He especially referred to *Phenacolestes* from Florissant. The nearer the nodus is to the base of the wing the later the dragon-fly usually is in geological time. The venation is denser in the earlier forms and in the later there is a smaller number of veins. The venation in *Ortholestes*, *Lestes* and *Enallagma* was compared and shown by enlarged drawings.

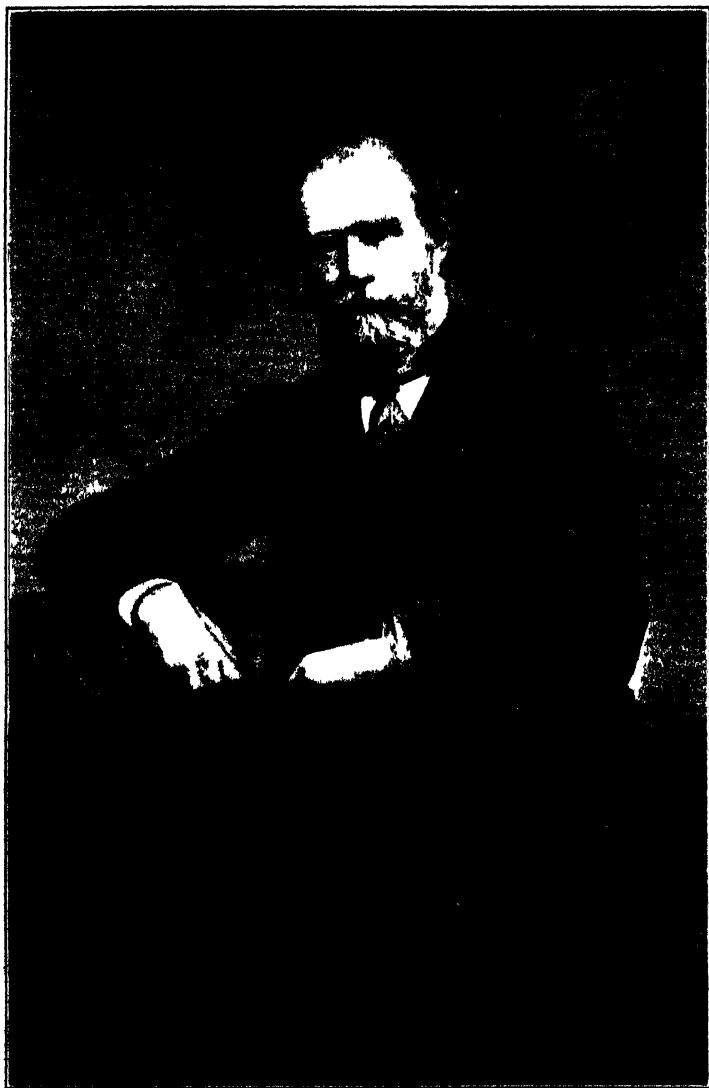
Mr. Rehn spoke of the neurulation of *Protoblattina* and the present cock-roaches. Mr. Cresson said the Tipulidae were considered to be quite ancient types of Diptera.

Mr. G. M. Greene said that many chestnut trees in Fairmount Park had been cut down and from them on March 23rd he had collected *Ips fasciatus* and other Coleoptera.

Mr. West exhibited a number of species of *Catocala* taken at Pitman Grove, New Jersey. He took eight *relicta* at Cramer Hill, Camden County, N. J.

Mr. Rehn referred to the Monthly Bulletin of the State Commission of Horticulture of California, Vol. 2, Nos. 1 and 2, and said that figure 19, labelled *Microcentrum laurifolium*, represents a species of *Scudderia*.

HENRY SKINNER, Recorder.



SIR JOHN LUBBOCK, LORD AVEBURY.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXIV.

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Sir John Lubbock, Lord Avebury.

(Portrait, Plate IX.)

In the death of Lord Avebury, on May 28, there passed away the youngest, but not the last, of that group of famous English naturalists intimately associated with Darwin and the promulgation of his theories. For it was to Lubbock that Darwin wrote on November 15, 1859, after the appearance of the *Origin of Species*: "I care not for Reviews; but for the opinion of men like you and Hooker and Huxley and Lyell, etc." Lubbock too was present at the famous meeting of the British Association for the Advancement of Science in the University Museum, Oxford, June 30, 1860, at which the new views were under discussion, and spoke in their support. Huxley, months before, in a letter to Leuckart, January 30, 1859, had referred to him as "my friend, Mr. Lubbock (a very competent worker, with whose paper on *Daphnia* you are doubtless acquainted)." Still earlier, the entomological intercourse of Darwin and Lubbock is attested by a letter from the former to the latter, before 1857:

I do not know whether you care about beetles, but for the chance I send this in a bottle, which I never remember having seen. . . . I feel like an old war horse at the sound of the trumpet when I read about the capturing of rare beetles—is not this a magnanimous simile for a decayed entomologist?—It really almost makes me long to begin collecting again.

Son, grandson and greatgrandson of three baronets, all bankers, Lubbock was born in London, April 30, 1834. He was an Eton scholar, but not a University man, entering his father's banking house at the age of fourteen. Of this firm, Robarts, Lubbock & Co., established about 1750, he subsequently became head. He took an active part in introducing new clearing systems, improving the personnel of banking staffs and at various times was Secretary or President of the London Bankers, Associated Chambers of Commerce, Central Association of English Bankers and the London Chamber of Commerce.

In 1870 he entered the House of Commons, serving as member for Maidstone, Kent, until 1880, when, defeated in that borough, he was elected to represent the University of London until 1890. While in Parliament he secured the passage of many acts having in view the improvement of the working classes, the best known among these being that establishing the "bank holidays."

But it is with his career as an entomologist that we are concerned. In the list of his own papers on "the Annulosa and especially of Insects," in the preface to the 1895 edition of *On the Origin and Metamorphoses of Insects*, the first title is *On Labidocera*, 1853. The list exhibits the range of his entomological activity. Thus there are general papers, such as *On the Respiration of Insects*, 1857; *On the Ova and Pseud-ova of Insects*, 1858; *On the Distribution of Tracheae in Insects*, 1860; *On the Generative Organs and on the Formation of the Egg in Annulosa*, 1861; *Metamorphoses of Insects*, 1866, and *On the Origin of Insects*, 1871, in which last he agreed with Brauer in considering *Campodea* as the form most nearly approaching the ideal stem-form of the Insecta.

On the Origin and Metamorphoses of Insects (first edition

1873, reprinted 1874, 1883, 1890, 1895), quoted in the German text-books on anatomy and embryology of invertebrates, summed up those parts of his previous researches which were of a more general character, having reference to the nature of metamorphoses and to the origin of insects. It was published first in *Nature* and later, with some additions, in book form. It was one of the earliest applications in English of the theories of evolution and of natural selection to the main characteristics of insect life and development.

Lubbock tells us in his *Monograph of the Collembola and Thysanura* (London, Ray Society, 1873) that in 1863 he published his

first memoir on the Collembola, which was followed by a second in the year following, a third in 1867, and a fourth in 1869. In these memoirs I have recorded about sixty species and have given some account of their habits and anatomy. As regards the latter, I differed in many important points from Nicolet, to whom we were indebted for the first account of their internal organization. For instance, as regards the digestive organs, I found myself compelled to question the presence of Malpighian vessels. Again, with the exception of *Sminthurus*, I found to my surprise that the Collembola had no tracheae, while Nicolet figured a complete system of them in *Podura*, and apparently considered that a similar arrangement prevailed throughout the group (p. 29). . . . We must, indeed, in my opinion, separate them [Thysanura and Collembola] entirely from one another; and I have proposed for the group comprised in the old genus *Podura* the term COLLEMBOLA, as indicating the existence of a projection or mammilla enabling the creature to attach or glue itself to the body on which it stands (p. 36) So far as I am aware, no naturalist had given any account of the muscular system of the Collembola before the publication of my papers in the Linnean Transactions. With patience and spirits of wine, however, I have been able to make out the principal muscles pretty clearly (pp. 89, 90).

Two papers, *On the Development of Chloeon* (1863, 1865), made known the long larval life of twenty stages of this May-fly. The Lepidoptera are represented by *On the Arrangement of the Cutaneous Muscles of Pygaera bucephala*, 1858, and *On the Colors of Caterpillars*, 1878; the Hemiptera by *On Coccus Hesperidum*, 1858; the Diptera by *On the Development of Lonchoptera*, 1862.

On Two Aquatic Hymenoptera, 1863, announced the discovery of *Polynema natans* and *Prestwichia aquatica*, both of which swim completely submerged, the former by means of its wings, the latter by its legs. The first of a series of ten *Observations on Ants, Bees and Wasps* appeared in the *Journal of the Linnean Society* for 1873 and continued until 1882. Their results were gathered into the well-known volume, *Ants, Bees and Wasps* (1884), in the International Scientific Series. In the preface to this last he says:

The principal point in which my mode of experimenting has differed from that of previous observers has been that I have carefully marked and watched particular insects; and secondly, that I have had nests under observation for long periods. No one before had ever kept an ant's nest for more than a few months. I have one now in my room which has been under constant observation ever since 1874, *i. e.*, for more than seven years.

The International Scientific Series includes another volume by Lubbock, *On the Senses, Instincts and Intelligence of Animals with Special Reference to Insects* (1888).

His scientific interests did not stop here. Three volumes are concerned with *British Wild Flowers considered in relation to Insects*, *On Seedlings*, and *Flowers, Fruits and Leaves*. Ethnology and archaeology early attracted him and he produced *Prehistoric Times as illustrated by Ancient Remains and the Manners and Customs of Modern Savages*, 1865, and *The Origin of Civilisation and the Primitive Condition of Man*. When he was raised to the peerage in 1900, his title was taken from the temple of Avebury in Wiltshire, the greatest of all so-called Druidical monuments, which "appears to have been the finest megalithic ruin in Europe."

Better known of his books are *The Use of Life*, *The Beauties of Nature* and *The Pleasures of Life*, which have had a wide circulation, it being stated of the last-named as long ago as 1900 that it had gone through thirty-seven editions in Great Britain and twenty-five abroad, and, more recently, that 259,000 copies had been sold. Still other volumes are his *Scientific Lectures*, *Political and Educational Addresses* and *Fifty Years of Science* (1881).

Space is lacking to enumerate the numerous financial and

educational public services which he rendered and the scientific societies which bore his name on their rolls. "The wonder is that he was excellent in so many directions, surpassing those who had given their lives to but one of his many interests."

He was twice married and is survived by six sons and four daughters.

P. P. C.

(In response to a request for biographical data from the Academy of Natural Sciences of Philadelphia, of which he was a correspondent, Lord Avebury once sent a copy of *The South American Journal*, London, for February 24, 1900, containing a sketch of his life. From this sketch we have obtained many particulars.)

On the *Criorhina intersistens* Walker and an Allied Species (Dipt.).

By CHARLES W. JOHNSON, Boston, Mass.

For a number of years there has been considerable confusion regarding the standing of *Xylota badia* and *Eristalis intersistens* Walker. In the collections under my charge and probably in the collections of others this confusion is due to the presence of two species, the females of which closely resemble each other.

That Walker's descriptions refer to one and the same species is very evident, notwithstanding the absence of the facial stripe in the description of *X. badia*.

Female: Body brassy, head covered with pale tawny down * * chest thickly clothed with long, pale tawny hairs; abdomen black, clothed with short hoary hairs, yellow on each side of base and thence in two narrow stripes beyond the middle legs pitchy; thighs pale yellow towards the base, knees and extremities of shanks yellow, feet tawny, hind feet pitchy, tawny at the base * * Length of the body 4 lines. New York. (List Dipt. Brit. Mus. pt. III, p. 559).

The description of *E. intersistens* (sex not given) is essentially as follows:

Body black, head clothed with whitish hairs and down, pale yellow with three black stripes in front * * chest and breast brassy green clothed with tawny hairs; abdomen elliptical * * thinly clothed with tawny hairs; sides irregularly tawny for more than half the length

from the base; legs tawny, hips black, a broad black band across each thigh and shank; feet pitchy, tawny at base. Length $4\frac{1}{2}$ -5 lines. Trenton Falls, N. Y. (List Dipt. Brit. Mus. pt. III, p. 615).

The three black stripes evidently refer to the facial stripe and cheeks.

It seems therefore evident that *badia*, on page 559, should be used instead of *intersistens* on page 615. In regard to the genus, as I pointed out in *Psyche* (Vol. XVIII, p. 73, 1911) *Blera* Billberg 1820 (Type *Musca fallax* Linné), antedates *Criorhina* Meigen, 1822 (Type *Syrphus asilicus* Fallen). At the time, I advanced this name chiefly to offset *Penthesilia* Meigen, 1800 (no species mentioned). On the other hand, recognizing *Criorhina* to include only the large pilose species as is done by European authors and by Williston in his synopsis of the North American Syrphidae, then *Cynorhina* Will. becomes a synonym of *Blera*. In any event I cannot see how we can ignore *Blera* as the author's intention is very clear.

***Blera confusa* sp. n.**

Male. Face yellow covered with yellowish pollen, vertical triangle, antennal process, facial stripe and cheeks, shining black; occiput black, margins grayish pollinose, with long whitish hairs; proboscis and the first and second joints of the antennae black, the third joint and the arista brown. Thorax greenish black, shining, with long dull yellowish pile, humeri grayish pollinose. Abdomen black with a bluish reflection in certain lights; sides of the second and third segments with large yellow triangles, those on the second larger and less regular than those on the third; fourth segment with small yellow triangles at the anterior angles; pile yellowish except on the black areas of the second and third segments where it is black; venter with the second and third segments yellow. Halteres yellow. Legs black, tops of the femora, bases and tips of all the tibiae, and the first three joints of the anterior and middle tarsi yellow. Wings brownish hyaline, veins dark brown. Length 10 mm.

Female. Similar to the male, except that the yellow triangles on the third abdominal segment are much smaller and scarcely dorsal beyond the posterior margin of the one on the second segment, third with only a yellow spot at the anterior angle, pile dull yellow or gray mixed with black dorsally near the posterior margins of the segments, venter with only the second segment yellow. Front black, shining, slightly covered with a grayish pollen and whitish hairs. Length 11 mm.

Eleven specimens. Holotype and allotype, Capens, Moose-

head Lake, Maine, July 14 and 19, 1907 (C. W. Johnson), in the collection of the Boston Society of Natural History.

Paratypes, Princeton, Maine, July 12, 1909; Franconia, New Hampshire (Mrs. A. T. Slosson); White Mountains, near Glen House (Dr. Geo. Dimmock); Ricketts, North Mt., Pennsylvania, June 8, 1898 (C. W. J.).

Readily separated from *B. badia* by its less prominent antennal process, the black middle and posterior femora, and the large yellow triangular markings on the third abdominal segment, especially in the male. It is a species belonging to the Canadian zone, while *B. badia* practically belongs to the transition zone and is only occasionally taken in areas frequented by a few species found in both zones.

Thirteen specimens of *B. badia* show the following distribution: Northeast Harbor, Maine, July 19, 1909 (Dr. C. S. Minot); Franconia, New Hampshire (Mrs. Slosson); Manchester, Vermont, June 9; Auburndale, June 15, North Adams, June 14, and Mt. Everett, Massachusetts, June 28; Darien, Conn., June 10; Philadelphia, June 30; Edge Hill, June 5, and North Mt., Pennsylvania, June 8 (C. W. J.).

The First Fossil Anthomyid Fly from Florissant (Dipt.).

By T. D. A. COCKERELL, Boulder, Colorado.

Anthomyia (sens. lat.) *atavella* n. sp.

Length nearly 6 mm., of wing 4.25; robust, bristly; the head, thorax and legs were apparently black; the abdomen as preserved is warm reddish, with the sutures pallid, it was probably brown; wings perfectly clear, veins dark. Top of head with large bristles directed forward, as in *Lispa uliginosa*; palpi about 480 μ long and 80 broad near end, feebly clavate, with bristles not longer than diameter of palpus (these palpi are essentially as in *Hyetodesia leucorum*); thorax elevated, scutellum prominent, dorsal thoracic macrochaetae very large, one near base of wing over 640 μ long, the long bristles and short hairs apparently practically as in *Hyetodesia*, but the precise arrangement cannot be made out; four very large macrochaetae can be seen in the longitudinal subdorsal row, before the scutellum; abdomen with thinly scattered bristles, the largest in a row near the hind margins of the segments, these being about 350 μ long, the arrangement very nearly as in the Muscid *Myiospila mediatubunda*; legs bristly, the hind

femora with a row of large erect bristles on the upper side as in *Hyetodesia leucorum*; costa densely beset with very short black bristles; auxiliary vein reaching costa about 1600 μ from base of wing, running close to first vein for about 1215 μ , then rapidly leaving it, but the bend not very abrupt; first vein not especially thickened, reaching costa about 480 μ beyond end of auxiliary; second vein little arched, it and the third ending as in *Lasiops spiniger*; anterior cross-vein about 830 from end of discal cell, and about 1040 from its base; outer side of discal cell quite straight; fourth vein beyond the discal cell gently arched upwards, and then near the end with a short curve downwards.

Miocene shales of Florissant, Colorado, Station 13 (W. P. Cockerell). I cannot make out the squamae, but after close study and comparisons (especially with Cordyluridae) I am satisfied that this is a genuine Anthomyiid, the first to be described from Florissant. It is hardly possible to place it in a modern restricted genus, the characters used as generic being in large part invisible.

Scudder described two flies assigned to *Anthomyia* from the tertiary strata at Quesnel, British Columbia; these may be separated from *A. atavella* as follows:

Apical side of discal cell about as long as its side on first posterior (as in *Lasiops*, *Hyetodesia*, and most modern forms) *A. burgessi* Scudd.

Apical side of discal cell much shorter than its side on first posterior (a *Scatophaga*-like characters) I

1. Wing 4.25 mm. long; at level of end of discal cell, first posterior twice as wide as submarginal cell (*Hyetodesia* approaches this)

A. atavella Ckll.

Wing 6.2 mm. long; at level of end of discal cell, first posterior not much wider than submarginal (as in *Homalomyia*)

A. inanimata Scudd.

In all these American fossils the upper apical corner of the discal cell is practically a right angle, as in *Lasiops* and *Homalomyia*; in the three species described as *Anthomyia* by Heer from Europe (Radoboj) this angle is very acute, as in *Homomyia* and *Hydrophoria*. Is it possible that this difference distinguishes the American and Palaearctic Anthomyidae of mid-tertiary times, one set of genera having evolved during the Eocene or earlier in America, the other in the Old World? To-day, of course, the two series are inextricably mixed in the northern faunae.

On Three new Species of Myrmeleonidae from Japan and Formosa (Neur. Planip.).

By WARO NAKAHARA, Tokyo, Japan.

On studying my collection of Myrmeleonidae, I have discovered a number of specimens from Japan and Formosa which seem to represent three new species, and so I propose to describe them in the present paper.

Acanthaclisis kawaii n. sp.

Fuscous with gray villoosity. Face yellowish-white, palpi and base of antennae yellow; antennae short, stout and black; maxillary palpi yellow, slender and cylindrical; labial palpi nearly ochraceous, especially the last joint, and very long; vertex fuscous black with two elevations, separated by a middle impression, anteriorly with an ochraceous band.

Prothorax quadrangular with two transverse impressions, front margin about straight but slightly impressed in the middle, fuscous black with seven irregular grayish longitudinal lines above, under side whitish yellow; a small depression exists near the mesothorax; above clothed with black hairs, but underside with long, white ones. Mesos- and metathorax also fuscous-black, with some reddish-yellow spots above, metathorax and the underside of both segments clothed with very long and silvery white hairs.

Abdomen deep grayish-black, hind margins of last four segments brown, the first one of them with a yellowish-brown spot on each posterior corner; underside yellow, basal half of segments mostly dark yellow, and a few basal segments clothed with long white hairs. In the female, the last segment short, split below, near the ventral margin with one long shining cylindrical appendage with black hairs; additional short segments with black hairs and spines, consist two plates.

Fore-leg black with very long white hairs; coxae and basal part of femora light ochraceous; femora mostly black; tibia black with some brownish spots and a long testaceous spur; claws testaceous. Middle-leg nearly as in the fore-leg, but the brownish spots of tibia are more yellowish and much larger. Hind-leg pale, with few hairs; coxae and femora light brown; the inner side of tibia black, but the outer side whitish.

Wings semi-vitreous, neuration yellow, strongly streaked and spotted with black. In the fore-wing the costal area is occupied by two regular rows of pentagonal cellules, those of the upper row slightly smaller than those of the lower; pterostigma milk-white, and not marked with any color.

Length of body, 40 mm.; fore-wing, 53 mm.; hind-wing, 47 mm.; antennae, 9 mm.

A single female specimen I owe to the kindness of my friend, Mr. S. Kawai. This specimen was captured by one of his friends at Banshoryo, Formosa, at the end of September last year.

This species is allied to Hagen's *A. japonica*, but it differs in many respects, especially in the color of the ventral side of the abdomen.

***Formicaleo esakii* n. sp.**

Blackish. Face and palpi yellow, the last joint of labial palpi ochraceous. Antennae fuscous black, anterior margin of most of the joints narrowly yellowish, basal joint yellow with a narrow fuscous ring in the middle. Vertex black and swollen, with a few yellowish brown spots on the hind margin.

Prothorax longer than broad, little narrower in front, with a transverse impression anteriorly and broad concave space posteriorly; both anterior corners yellowish brown, and from this spot a narrow longitudinal line runs toward the hind margin; median brown line scarcely seen in front. Meso- and metathorax dull black; on the meso-thorax there is a yellow spot before the base of the fore-wing; lateral surfaces irregularly ochraceous.

Abdomen black; the third segment with two yellowish bands, one anterior and another along the posterior margin; the fourth and fifth segments with a yellowish band near the anterior margin; a large yellow spot exists on the sixth segment and also a small one near the posterior margin along both sides; anterior half of seventh segment yellow, posterior sides also yellow. A few of terminal segments are yellowish in ventral side. Genital parts are quite imperfect in my specimen; additional segments mostly yellow.

Fore-leg dark; outer side of coxae black, but inner side pale yellow; femora yellowish, outer side a little ochraceous and extremity black; tibia also yellowish with three broad black or ochraceous rings; spurs ochraceous, long and curved. Middle-leg yellowish; tibia with a longitudinal narrow blackish line and two broad, black rings. Hind-leg also yellowish; femora with many strong black spines, not hairs only; tibia with two broad black rings, one near the base and another in the extremity. Tarsal joints of all the legs yellowish except the last joint black in each leg; claws all testaceous and curved.

Wings elongated; hind-wing much shorter and more acute than fore-wing; vitreous with a fuscous spot near the termination of the cubital vein in the fore-wing. Neuration mostly black, interrupted with yellow or milky white; costal transversals mostly black, but pale near the base of the wings. Some small light fuscous spots, four of them in a row, exist near the apex of fore-wing as well as of hind-

wing very slightly; a very small, but deeply colored spot exists near the hind margin of hind wing. Pterostigma grayish white, marked with fuscous black.

Length of body, 33 mm.; fore-wing, 38 mm.; hind-wing, 36 mm.; antenna, 8 mm.

I received a male specimen from my friend, Mr. T. Esaki, who captured it on the night of August 24, 1911, when he was traveling through the northern part of the main island of Japan. He told me that the specimen had flown in at the window of the train by which he was traveling near the town of Taira, attracted by the light.

This species is allied to *Formicaleo contubernalis* McL., but, as stated above, its vertex is without spot, while that of *contubernalis* has numerous small orange-yellow spots; hind leg of the former with strong black spines, while that of the latter has long white hairs only; pterostigma of the former is distinctly marked with fuscous black, and the costal transverse veins mostly black, while those of the latter are indistinct and wholly pale. Moreover, the markings of the abdomen readily separate the two, because in the present species the second segment is without spot except that of the hind margin, and the third segment has one broad band in addition to that of the hind margin, while both the segments of *contubernalis* have a narrow interrupted dorsal orange-yellow line, and the sides of the third with the same colored spots.

With the above differences, I doubt not that, although allied, the two are distinct.

***Myrmeleon ochraceopennis* n. sp.**

Face above the epistome blackish brown, shining; an obscure and irregular impressed spot in the middle between the antennae; mouth and a ring around eye yellowish, the latter often interrupted. Maxillary palpi thin, fulvous brown, the last joint cylindrical and notched on tip; labial palpi about two and a half times the length of the maxillary, fulvous brown, the last joint fusiform, and its conical tip notched. Antennae dull black, as long as the thorax; tip clavate and flattened, the very extremity little curved; a yellow ring exists around the two basal joints. Vertex blackish and transversely ovoid, elevated, and divided by a slight median impression; on top with irregular black spots; hind margin lighted with yellowish fuscous; in the male, the median impres-

sion is slighter than in the female; a yellowish fuscous line runs along the impression and unites with the similarly colored spot on the hind margin.

Prothorax dark ochraceous and short, little broader than long, little enlarged behind, and somewhat rounded before; two slight transverse impressions, one near the hind margin and another in the middle; on each side with some long and strong hairs. Meso- and metathorax dark ochraceous above, ventral side yellowish.

Abdomen slender, and shorter than wings, underside somewhat yellowish.

Legs slender, with black hairs; coxae and femora yellow, the latter thicker in the middle, slender portion more or less suffused with brown; tibiae and all tarsal joints black, shining; spurs as long as the basal tarsal joint, nearly straight and testaceous; claws testaceous.

Wings hyaline, suffused with light yellowish brown, inner margin strongly suffused with dark brown; a darkish narrow cloud exists between the radial and the 1st cubital veins; more deeply clouded below this; upper one is rather wide in the hind wing and much inclined to unite itself with the lower one; veins mostly pale, but the sub-costal, radial and cubital veins yellowish orange; pterostigma small, especially in the hind-wing, rounded and milk-white.

Length of body, ♂ 40 mm., ♀ 50 mm.; fore-wing, ♂ 50 mm., ♀ 57 mm.; hind-wing, ♂ 50 mm., ♀ 58 mm.; antennae, ♂ 12 mm., ♀ 10 mm.

A male and a female specimen captured by Mr. K. Asakura at Horisha, Formosa.

This splendid species is undoubtedly the largest of the genus *Myrmeleon* in Japan and also, of course, one of the largest of known species.

If the formation of new genera, *Baliga*, *Balaga* and *Enza*, which Navas proposes on the basis of the difference of neuration, be justified, this species may also perhaps represent a new genus, because such a difference between *Baliga asakurae* (Matsumura) and *Balaga micans* (McLachlan) is readily found among this and other species. But I am much inclined to think that the Navas classification may not be justified.

The species described from Japan by Okamoto in Wien. Entom. Zeit., xxix, 1910, and by the author in the present paper, taken together, number eighteen. In addition to these a species, *Enza otiosus*, which I ventured to transfer to the

genus *Myrmeleon*, had been described by Navas as from Japan in Rev. Rus. Ent., xii, 1912, so that the number of species of Japanese Myrmeleonidae, including Formosan ones, now amounts to 19, as follows:

1. *Dendroleon jezoensis* Matsumura. Hab.:—Hokkaido, Honto (Main Island of Japan).
2. *D. japonicus* M'Lachlan.—Hab.:—Honto.
3. *Creagris matsukae* Okamoto. Hab.:—Honto.
4. *Acanthachsis japonica* Hagen. Hab.:—Hokkaido, Honto.
- 5. *A. kawaii* Nakahara. Hab.:—Formosa.
6. *Epacanthachsis moiwasana* Matsumura. Hab.:—Hokkaido, Honto.
7. *Formicaleo nigricans* Okamoto. Hab.:—Honto.
8. *F. contubernalis* M'Lachlan. Hab.:—Honto.
9. *F. esakii* Nakahara. Hab.:—Honto.
10. *F. acuminatus* Matsumura. Hab.:—Ogasawara, Riukiu.
11. *F. formosanus* Okamoto. Hab.:—Formosa.
12. *Myrmecalurus parvulus* Matsumura. Hab.:—Riukiu.
13. *Glenuroides communis* Okamoto. Hab.:—Hokkaido, Honto, Kiushu.
- 14. *G. okinawensis* Okamoto. Hab.:—Riukiu.
15. *Myrmeleon asakurae* Matsumura. Hab.:—Formosa.
16. *M. ochraceopennis* Nakahara. Hab.:—Formosa.
17. *M. micans* M'Lachlan. Hab.:—Honto, Kiushu, Riukiu.
18. *M. otiosus* Navas. Hab.:—“Japan.”
19. *M. formicarius* Linné. Hab.:—Hokkaido, Honto, Kiushu?, Riukiu; Europe, China, etc.
93. Komagome-Higashikatamachi, Hongoku, Tokyo, Japan.

A new Lycaenid from Kamerun, West Africa (Lep.).

By W. J. HOLLAND, Director, Carnegie Museum,
Pittsburgh, Pa.

In a lot of material recently received from Dr. H. L. Weber, of Efulen, Kamerun, I have been pleased to detect what I believe to be a hitherto unrecognized genus of the family Lycaenidae. It is represented by a pair, the female taken at Efulen, the male at Lolodorf, about forty miles distant from the former place. The markings of the under side of the wings strikingly resemble those of certain species of the South American genus *Euptychia*, belonging to the family Satyridae, and I have accordingly coined the name *Satyrinima*

for the new genus. So far as I have been able to ascertain, this name is not preoccupied.

***Satyrinima weberi* gen. et sp. nov.**

The antennæ are scarcely half as long as the costa of the primaries, slender, with a moderately long club at the end, blackish above, lighter in color on the lower side. The eyes are naked. The palpi are relatively short, divergent, with the basal joint short, the second joint strongly curved upward, the third small, conical, acuminate, porrect. The first and second joints are densely clothed with appressed scales, the third less so. The fore-legs are armed at their extremities with minute recurved claws. The color of the legs is dark brown. A better idea of the neuration of the wings is conveyed by the accompanying cut (Fig. 1) than could be given by a lengthy verbal description.

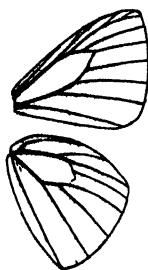


Fig. 1. Neuration of *S. weberi*, ♂.
Natural size.

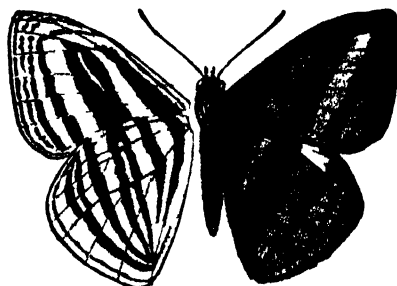


Fig. 2. *S. weberi* Holland, ♂.
 $\frac{1}{2}$ larger than natural size.

♂. Expanse of wings 40 mm. The ground color of the upper side of the wings is light indigo-blue, through which the dark bands of the under side show through more or less distinctly. The primaries at the apex and on the outer margin are broadly black; the secondaries are narrowly margined with black, the margin being widest at the outer angle, and gradually diminishing in width toward the anal angle. Beyond the cell of the primaries toward the apex is a diffuse white spot. A similar white spot is located on the secondaries on the upper margin, a little beyond the middle. The thorax and abdomen are black above, whitish below. The wings on the under side are white, banded and spotted as shown in the accompanying cut (Fig. 2).

♀. Expanse 45 mm. The wings of the female are broader than those of the male. The white spot which appears on the primaries of the male marks the uppermost point of an acutely angulated white band, which from this point runs inward to the middle of the costa of the primaries, and downward to the middle of the inner margin of this wing and is continued upon the secondaries toward the anal angle of the latter, becoming gradually indistinct before reaching the

anal extremity of the wing. The ground-color of the wings in this sex is prevalently brownish, with a faint shimmer of blue toward the base and inner margins of both the primaries and secondaries. The dark bands on the outer margin of the wings on the upper side are broader and more diffuse than in the male. The maculation of the under side of the wings is like that in the male sex, but the markings are broader and more diffuse.

Types, male and female, in the collection of the Carnegie Museum.

How does the House-fly pass the Winter? (Dipt.).

By HENRY SKINNER.

I have never been convinced that in the locality of Philadelphia the house-fly lives through the winter in the imago condition. I have seen belated individuals in our homes and other buildings, but never concluded that any of them survived the winter and oviposited in the spring.

Howard says, "The adult flies undoubtedly remain dormant even in warmed dwellings, and it is altogether likely that some of them remain dormant throughout the winter months in sheltered but cold situations. Many adult insects pass the winter in this way, and observations have been made which indicate that this is the case with the house-fly, although as a matter of fact sufficient attention has not been paid in the observations on record of the exact specific identity of the flies in question." He quotes the observations of Jepson, made in Cambridge, England, who observed them for some time, finding them in the same positions and still living a month later. "His observations ceased at the end of January, but he saw no reason why they should not live on until spring and then begin to breed." Jepson's observations are inferential and inconclusive in so far as our question is concerned, as it is not shown that any specimens actually survived to breed in the spring.

Hewitt says, "With the approach of the cold weather season in October and November the flies seem to disappear and in all but the warmest places, such as kitchens, restaurants and stables, and even in these places their numbers are decreased.

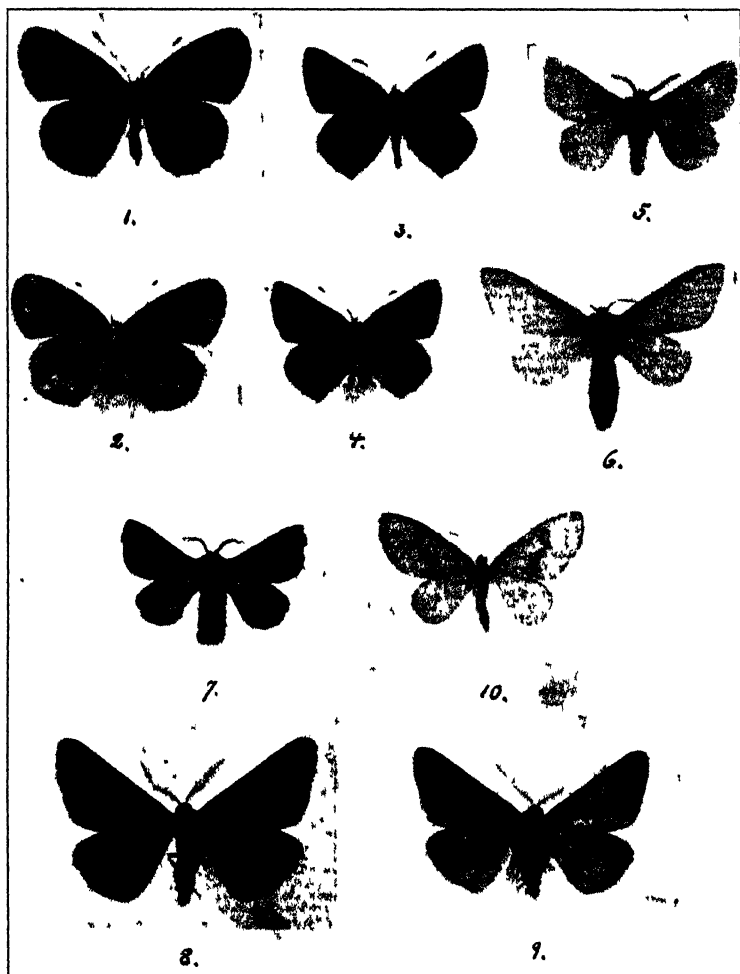
The question is constantly asked: What becomes of the flies during the winter? Most of them die; the remainder hibernate."

Sanitarians have accepted the hibernation theory and recommend killing all the flies seen in the early spring, which they say are all hibernating females, about to oviposit. In this way they hope to cut off the egg supply in its incipency.

Observations made this past spring appear to show that the house-fly lives through the winter in the pupal stage. If this be correct, it seems reasonable to suppose that it is the only way in which the insect lives through the winter, on the theory that insects belonging to this order only pass through the winter in a given stage and never in two stages. The observations were made in the entomological rooms of the Academy of Natural Sciences of Philadelphia. No flies were observed in the rooms during the past winter, but as soon as the first warm days of early spring arrived the windows were opened and flies came in. Some of these were caught on March 13th of this year. They were all fresh specimens, even teneral in character except in color. The ptilinum was not completely retracted and it was evident that they had just emerged. The colors were bright and the wings perfect and not frayed in any way, and there was no sign of dust, dirt or decay on them. All in all it was quite evident that they had recently emerged. Both sexes were represented. Until disproved, I will answer the question at the head of this article as follows: House-flies pass the winter in the pupal stage and in no other way.

Charts of Food Plants of Lepidoptera.

Miss Ximena McGlashan, from her Butterfly Farm at Truckee, California, has sent out several lists of food-plants of North American Butterflies and Moths, dated January, March, April and May, 1913, respectively. As summaries of information they are very useful, but it has been suggested that the size, especially of the larger "charts," is inconvenient and cumbersome and that ordinary book or pamphlet form would be more agreeable. Miss McGlashan asks the aid of all interested in the compilation of a complete list.



NEW LEPIDOPTERA FROM MASSACHUSETTS -REIFF

Some new forms of Lepidoptera from Massachusetts.

By WILLIAM REIFF, Forest Hills Sta., Boston, Mass.

(Plate X.)

The season of 1912 yielded a number of atypical lepidopterous forms, six of which are described in the present paper.

Phyciodes tharos Dru. f. nov. **reaghi** (Figs. 1 and 2).

One ♀ derived from summer form *morpheus* Fab. Upper surface of fore wings much blackened in basal and median spaces, with light spots obsolete in marginal band. The latter very broad and black, this color extending over upon the costa for about one-half its length. Black markings near apex of primaries represented by a few black scales only. Black median line replaced by a broad, dull black, indefinite shading. The hind wings, on upper surface, have all markings in basal space obsolete. There is a black powdering in an indefinite, broad line at the base of these wings, parallel with the inner margin. Marginal band of secondaries uniform with primaries as regards width and intensity of shading. Exterior line of spots present. Parallel with this is a broad, black band extending into discal area and obscuring black spot normally present, in exterior line, near apex. At this point the broad band joins the marginal band.

On lower surface of primaries there are no black markings whatever, while all the colors are paler than in the normal form. Marginal band consists of four, large, irregular spots, alternately light yellow and reddish violet in color. This band is distinctly outlined by a narrow, uneven, reddish line. All other markings of marginal band are obsolete. The secondaries resemble somewhat, in pattern, the spring form *marcia* Edw. The ground tint is straw color, with three irregular, somewhat confluent, reddish violet spots of different sizes extending in series across discus from marginal band towards base. Two spots, in exterior band of upper surface, reappear faintly on lower surface, and are surrounded by a whitish tint. Corresponding with the inner margin of the black median band of the upper side of secondaries, is a wavy, reddish line on the under side. This line begins near the inner margin and connects the large, reddish spot near the discus with the spot nearest the outer margin. The character of the marginal band of secondaries is similar to that of the primaries. Beginning at the apex it is composed of straw colored, lavender, whitish, brownish lavender and light yellow spots of different sizes. The marginal band is outlined like that of the primaries.

This form finds its closest relative in f. *packardii* Saunders.

Type, 1 female, Franklin, Mass., Aug. 4, 1912; in coll. of Dr. Arthur L. Reagh, after whom I take pleasure in naming this aberrant form.

The above described specimen was taken by Dr. Reagh on the sandy shore of a pond, with full southern exposure, well protected from cold winds by woods and a hill. I, therefore, consider high temperature as the probable cause of this aberrant form, as in such a locality the intense summer heat could readily act on the chrysalis during its sensitive stage. Moreover, similar forms have already been artificially produced by heat in experiments on the related genus *Melitaea*.

Heodes hypophlaeas Boisd. f. nov. **caeca** (Figs. 3 and 4).

1 ♂ typical, 1 ♂ transitional.

Upper side. Exterior band of black spots on primaries completely wanting, except a faint, minute spot near the costa; in all other respects normal.

Underside. Spots in exterior band of primaries more or less obsolete and faint. Exterior band of black spots of secondaries completely wanting, also with the exception of a faint minute spot near the costa.

The typical specimen was taken by the author May 26, 1912, in a somewhat swampy meadow near the Blue Hills in Massachusetts. The transitional form was taken by Mr. Rudolf C. B. Bartsch, May 25, 1912, at West Roxbury, Mass., also in a somewhat swampy meadow.

Type in the author's collection. *Cotype* in Mr. Bartsch's collection.

I use for this form the same name, which has been proposed by Prof. Courvoisier, of Basel (Switzerland), the authority on Lycaenidae, for all the so-called "verarmten Formen" (*formae parvipunctae*) of this family, meaning forms with reduced or wanting maculation. In the palaearctic fauna we already know a great number of such forms and the recent description of such a form of the palaearctic *Chrysoph. alciphron gordius** is almost identical in its character with the above described form.

Malacosoma disstria Hb. f. nov. **astriata** (Figs. 5 and 6).

Upper and lower surfaces of both sets of wings and also thorax and abdomen of a uniform pale, straw-yellow color with no trace of

* Busse, R.—*Chrysophanus alciphron* var. *gordius* f. *caeca* Courv.—Entomol. Zeitschrift XXVI, No. 26, 1912. Frankfurt a-M.

stripes or spots. Fringes of wings uniformly whitish. Sexes alike in coloration, but antennae of male blackish, of female yellowish.

One male from Lincoln, Mass., July 13, 1912; taken by the author from a window of the railroad station; 1 male from West Roxbury, Mass., July 15, 1912, taken by Mr. Walter F. Eastman at light; 1 female, July 2, 1912, reared by the author from one of a number of caterpillars collected at Concord, Mass.

Type—1 male, 1 female, in the author's collection; 1 male cotype in Mr. Eastman's collection.

These albinic forms are undoubtedly inhibition products, the process of coloration of the imago during its last pupal stage probably having been inhibited or arrested by outside influences. Accidentally I happened to spill some chloroform into the box containing several hundred *disstria* pupae as I was killing the first specimens which had emerged. Since the box was covered with netting and the chloroform was thus allowed to escape quickly, my misfortune did not affect the life of the pupae; I obtained, however, from these pupae after two days, and then for the next four days every day, one or two imagos which were more or less crippled and *all of which showed this pale albinic coloration*. The one female specimen above described was the only one which developed perfectly. The pupae which gave rise in the field to the two albinic males may have been situated at places little protected from cold or moisture.

***Malacosoma disstria* Hb. f. nov. *anita* (Fig. 7).**

Wings, antennae, thorax and abdomen uniformly chocolate brown. Two spots in fringes of primaries near apex white, all other parts chocolate brown. Exterior line of primaries faintly visible on both surfaces. Above secondaries are without marking; on lower surface discal line is narrow, diffused, and of a pale buff color.

One male, July 2, 1912, reared by the author from one of a number of caterpillars collected at Concord, Mass.

Type in the author's collection.

I take pleasure in naming this form after my wife, whose valuable help in rearing hundreds of caterpillars I appreciate very much.

I am not aware that intensifications so well marked in this case can be produced by causes which may have given rise to the pale forms previously described.

Phigalia olivacearia Morr. f. nov. *mephistaria* (Figs. 8 and 9).

Wings, thorax and abdomen blackish, smoky. Antennae normally colored. Fringes of inner margin of secondaries whitish, otherwise like the wing surface. Beneath the wings are a shade lighter than above. Only a few faint traces of normal marking of wings, but veins darker than ground color of wings.

One male from West Roxbury, Mass., April 7, 1912; taken by Mr. Walter F. Eastman in the day time from an electric light post.

Type in Mr. Eastman's collection.

Among the North American Geometridae melanistic forms are almost unknown. There are, however, large numbers of such forms in the palaearctic fauna, and from year to year new melanistic forms of Geometridae continue to be discovered. Fifty years ago only one melanistic Geometrid was known, the black *doubledayaria* of *Amphidasis betularius*, and this form at that time from England only. Now we find *doubledayaria* and many other melanistic forms of palaearctic Geometridae distributed over an increasingly larger area of central Europe. Considered from a phylogenetical standpoint, this yearly increase of melanistic forms is of the greatest interest, and exact observations in localities, where such forms appear and the publication of all details of capture is very important. Up to date we are entirely incapable of stating any rule as to the origin of melanistic forms in the field and its increasing occurrence, although a number of theories have been suggested as to its cause, but none of them as yet has been sufficiently supported. We only know that melanistic forms are certainly neither pathological nor degenerative products (as many albinic forms are), for melanistic forms are as a rule more strongly built and more resistant towards climatic influences, etc., than their non-melanistic ancestors.

We know two kinds of black coloration: nigrism, which originates when the black (dark) markings of a wing become more or less enlarged, and melanism, which signifies an in-

crease in the number of dark scales^{""} and the pattern remains unchanged. Often, however, the melanistic process is so complete that the markings are entirely obscured. I consider here only the second kind of black coloration, namely melanism affecting the Geometridae. Nigristic forms are products of heat or cold, and they also can be produced artificially by temperature experiments. However, the form described above represents the type of a special subdivision of melanistic forms. For the markings have disappeared almost entirely in this case, while in other cases of melanism they remain unchanged. The markings are here not obscured by dark scales as might be supposed, for the coloration is of a dark *smoky* color and not dense enough to hide markings, if such were present.

I propose to express this subdivision of melanistic forms (appearance of dark scales, together with disappearance of wing markings) by the collective term "*formae melanoticae simplices*."

Nyctobia anguilineata Gr. f. nov. **eastmani** (Fig. 10).

Primaries above white. The following markings are present: faint brown basal line, brown median band not very strongly defined, but appearing distinct on account of the light wing coloration; a terminal line of brown dots.

Secondaries above white and hyaline, becoming slightly dusky towards the outer margin; no markings, except a very faint and minute black dot at the discus near costa.

Beneath, all wings white and hyaline with no markings, except reappearance of the minute black dot of the secondaries and this is even fainter than above.

Head, thorax and abdomen grayish-white, antennae brown.

One male from West Roxbury, Mass., April 28, 1912; taken by Mr. Walter F. Eastman from a hemlock tree. I take pleasure in naming this form after the collector.

Type in Mr. Eastman's collection.

I regard this form as an albino of a form parallel to the f. *reiffii* Sw. of *Nyctobia limitata*, and it may be developed through the influence of low temperature upon the pupa shortly before the coloration process of the wings had begun.

Finally one word may be said concerning the naming of in-

dividual forms or "sports." Unfortunately we meet quite often still with the old view that the naming of "aberrations, mutations," etc., is of no value. In opposition to this view I wish to say that we know a species only, if we are acquainted with *all* of its forms and their causes. In order to make all the forms known and to separate them from each other it is necessary to mark them in some way. Since, however, a designation of forms by letters or numbers cannot be carried out, we are obliged to give them names. Of course it is necessary only to characterize the extremes of each variation. Transition forms hardly need special names, or only in exceptional cases, as, for instance, for defining forms which develop at certain temperatures or for other definite causes.

The figures on Plate X are a little less than natural size and a shade too light.

The Species of *Nehalennia* (Odonata),

Including one from the eastern United States hitherto undescribed.

By PHILIP P. CALVERT, Ph.D.,

University of Pennsylvania, Philadelphia, Pa.

The genus *Nehalennia* was established by de Selys in 1850 for the European *Agrion speciosum* Charp. In his synopsis of the legion Agrion in 1876 he included within *Nehalennia* the following seven species: *atrinuchalis* Selys (Shanghai), *speciosa* Charp. (Europe), *irene* Hagen (United States), *sophia* Selys, 1876 (Province of Minas, Brazil), *posita* Hagen (United States), *denticollis* Burm. (Mexico), and *lais* Selys (Mexico). In 1895 Morse described *N. gracilis* from Massachusetts. Calvert removed *denticollis* to *Ischnura* Charp. in 1898 and *lais* to *Anisagrion* Selys in 1902. In 1903 Needham transferred *posita* to *Ischnura*. Five described species thus remain in *Nehalennia*. References to the literature are given in the catalogues of Kirby and of Muttkowski. Dr. E. M. Walker has just published the differentials of the larvae of *N. irene* and *gracilis*.*

*Can. Ent., XLV, p. 61, pl. I, figs. 1-3. June, 1913.

Some years previous to 1908 I had ascertained the presence of another species of this genus in the United States and had noted the principal characters distinguishing it from *irene*, *gracilis* and *speciosa*. On this basis, I included in my notes, furnished to the late Prof. John B. Smith in 1909, for the List of New Jersey Insects then in preparation, the record of one female from Malaga, N. J., June 27, 1908, by Mr. V. A. E. Daecke as *Nehalennia integricollis* Calv.* My absence for a year in Costa Rica speedily followed and the publication of the description of *integricollis* was forgotten, so that the name has remained a *nomen nudum*. A recent inquiry by Mr. W. T. Davis as to the place of description has recalled the matter to my mind, hence the present paper.

The species of *Nehalennia* are summarized in the following synopsis: two of them, *atrinuchalis* Selys and *selysii* Kirby (Cat. Odon., 1890, p. 147, for *sophia* Selys 1876; nec *sophia* Selys 1840 = *speciosa* Charp., 1840), are known to me by descriptions only.

- I. Hind margin of prothorax convex, entire or nearly so ♂ ♀. Superior appendages ♂ longer than inferiors.

Thoracic dorsum dull metallic green reaching laterad to beyond the humeral suture, with reddish humeral and antehumeral lines. Three antenodal cells. ♂ Abd. segs. 8 and 9 blue, 10 black dorsally, its hind margin broadly and shallowly concave; superior appendages subconical, a little recurved toward each other as if compressed. ♀ Abd. segs. 8 and 9 bronze dorsally. Abd. male 20-22, female 22; hind wing, male 13, female 16 mm. (From de Selys' description.)... ***atrinuchalis***

Thoracic dorsum metallic green to beyond the humeral suture which often has a short pale stripe on its upper and another on its lower end. Three antenodal cells. ♂ Abd. seg. 8 dark metallic blue or metallic green with a pale blue mid-dorsal spot on the posterior third to half and the sides inferiorly pale blue; 9 chiefly pale blue, a broad dark metallic green or metallic blue band each side in proximal two-thirds; 10 pale blue, its hind dorsal margin cleft in the middle, a short process directed upward and caudad on each side of the cleft, each process spinulose at tip, margin otherwise not spinulose; superior appendages increasing in thickness to the apex when seen

* Ann. Rep. N. J. State Museum 1909, p. 75. Trenton, N. J. 1910.

in profile view. ♀ Abd. segs. 8-10 colored similarly to those of the ♂ but the blue on the dorsum of 8 often reaching farther toward the base and the lateral band on 9 farther posteriorly. Abd. male 20-23, female 19-22; hind wing, male 13-14, female 14-15 mm. *speciosa*

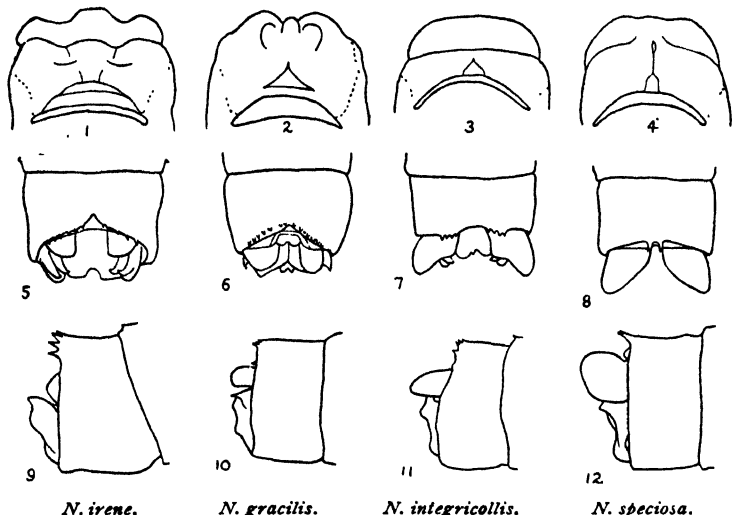
Thoracic dorsum bronze black not reaching as far laterad as the humeral suture which bears a black line. Three antenodal cells. ♂ Abd. segs. 8-10 pale blue with a bronze bilobed dorsal band on 8 and a small median spot on 9; hind margin of 10 forming two slightly marked festoons each bearing 5-6 blackish teeth; superior appendages conical, furnished at the base with an internal branch. Abd. 24-25, hind wing 15-15.5 mm. ♀ unknown. (From de Selys' description.) .. *selysii*

Thoracic dorsum ♂ bronze black reaching as far laterad as the humeral suture only at its upper sixth, the suture itself black, bordered mesad by a pale stripe one-fourth as wide as the mesepisternum on which it lies and reaching upward to five sixths of the length of the suture; of ♀ metallic green reaching laterad beyond the humeral suture which has a fine short yellow line on its upper and one on its lower end. Three (♂) or two (♀) antenodal cells. ♂ Abd. segs. 8 and 9 dark metallic blue, each with a narrow transverse pale line at base, interrupted at the middle on 8, and a narrower transverse pale line at the hind margin, sides pale blue which does not show in a dorsal view of 8 but is visible in a dorsal view of 9 especially near the hind end of the segment, no longitudinal lateral dark bands on 9; 10 pale blue with a little black at the base mid-dorsally, its hind dorsal margin concave in the middle, spinulose on each side of the emargination; superior appendages decreasing in thickness to the apex, seen in profile view. ♀ Abd. segs. 8 and 9 dark metallic blue-green, no pale dorsal spots on 8, a pale blue mid-dorsal posterior spot on 9 not half as long as the segment, sides inferiorly and 10 pale blue, the last with some traces of black or metallic green at the extreme base. Abd. ♂ 21, ♀ 18.5-20; hind wing, ♂ 13, ♀ 13-13.5 mm. *integricollis* n. sp.

- II. Hind margin of prothorax emarginated ♀, entire and convex ♂. Superior appendages ♂ equal to, or shorter than, the inferiors. Hind dorsal margin of abd. seg. 10 of ♂ cleft in the middle, spinulose on each side of the cleft. Thoracic dorsum metallic green, reaching laterad to beyond the humeral suture which is often marked as above stated for *speciosa*. Three antenodal cells.

Hind margin of prothorax of ♀ bilobed, but in front of the cleft separating the two lobes is a small more nearly erect process

which partly fills the cleft when the prothorax is viewed from in front, a median pair of slender approximated mesothoracic processes just behind the prothorax. ♂ Abd. seg. 8 blue with a*transverse dorsal basal black or metallic green line or narrow stripe, 9 and 10 entirely pale blue; superior appendages nearly as long but not as high as the inf. apps., seen in profile view. ♀ Abd. seg. 8 pale blue with a transverse basal stripe and a lateral band reaching caudad therefrom dark metallic green or black, or, the dorsum of 8 almost entirely blue-black, sides inferiorly pale (1 ♀), 9 blue with a triangular black band each side in proximal half of segment, 10 entirely blue. Abd. ♂ ♀ 20-22; hind wing ♂ 13-14.5, ♀ 14-15 mm.*gracilis*



Figs. 1-4, hind part of prothorax of females viewed from in front and a little above, the head of each specimen having been removed to see the prothorax clearly; the dotted lines show the boundaries of the median metallic green and the lateral pale green or yellow. Figs. 5-8, dorsal views of abdominal segment 10 and appendages of males. Figs. 9-12, profile views, right side of the same. All the figures drawn to the same scale with the camera lucida, specimens illuminated by direct sunlight.

N. irene, ♀, Lehigh Gap, Pennsylvania, July 13, 1900; ♂, Berlin, New Jersey, July 17, 1893. *N. gracilis*, ♀, Lehigh Gap, Pa., June 29, 1897; ♂, Sherborn, Massachusetts, June 24, 1895 (co-type of Morse). *N. integricollis* n. sp., ♀, Enterprise, Fla., April 18, 1896 (type); ♂, Haulover, Fla., March. *N. speciosa*, ♀ ♂, Robenhausen, Switzerland, July 3, 1904.

Hind margin of prothorax of ♀ trilobed, no slender mesothoracic processes as described for *gracilis* but the mesostigmal laminae are larger and more projecting than in that species. ♂ Abd. seg. 8 dark metallic green, a mid-dorsal spot on the posterior fourth or less and the sides inferiorly pale blue, 9 pale blue with a triangular dark metallic green spot on each

side of dorsum in its proximal half or more, 10 pale blue with a metallic green spot each side of dorsum at base; superior appendages much smaller than the inferiors, each of the latter with two black-tipped hooks. ♀ Abd. segs. 8 and 9 dark metallic green, sides inferiorly pale, 9 with a mid-dorsal anteapical pale blue spot, *or*, more rarely, 8 and 9 colored as in the male, 10 as in the male. Abd. male 20-23, female 20-22.5; hind wing male 13-15.5, female 14-15 mm. *irene*

Of *Nehalennia integricollis* I have seen five females from Florida, one from Thomasville, Georgia, April 28, 1903, by Mr. Morgan Hebard, and the one from Malaga, New Jersey, mentioned above. Of the five Florida females, one, the type of the species, is from Enterprise, April 18, 1896, by Mr. Philip Laurent; it is the specimen cited in Ent. News, vii, p. 302, as *N. irene* Hag.; two others, exact locality not recorded, are due to Dr. D. M. Castle in 1903 (cf. Ent. News, xiv, p. 244); a fourth, "Fla. exchange," has long been unidentified in the collection of the Academy of Natural Sciences of Philadelphia, while the fifth, from Enterprise, May 17, belongs to the Museum of Comparative Zoology, Cambridge, Mass. Excepting this last, these females are in the collection of the Academy named.

The single male referred to this species, from Haulover, Florida, in March (Museum of Comp. Zool.), may not be conspecific with these females, as the extent of dark coloration on the thoracic dorsum and the number of antenodal cells are different, as has been indicated above. It resembles the description of *N. selysii* Kirby (*sophia* Selys 1876) in many respects, but is smaller, has the proximal and distal sides of the pterostigma nearly parallel (proximal side more oblique than the distal in *selysii*), the posterior or inferior side of the quadrilateral of front wing more than twice as long as the anterior or superior side ("l'inferieur moitié plus long que le supérieur" in *selysii*), labrum with a transverse basal black band ("un point médian enfoncé" in *selysii*), nasus entirely black. The abdomen is not fully colored, 3-6 being of a pale brown with a narrow transverse basal pale blue ring; other differences in abdominal coloring may be seen from the

above synopsis. The appendages may be quite similar to those of *selysii*. The known habitats of the two forms are far apart.

It will be noticed that, in spite of its geographical distribution, *integricollis* is nearer structurally to the European and Brazilian species than to the two already known from the United States.

Dr. F. Ris, within recent years, has described* color varieties in Swiss specimens of *N. speciosa* which may possibly indicate a color dimorphism or polymorphism among the females analogous to that known in *Ischnura*. In this connection it is of interest to note that I found a single female of *N. irene* from Manchester, Maine, June 12, 1899, by Miss Mattie Wadsworth (now in the collection of Mr. E. B. Williamson†), which has abdominal segments 8 and 9 colored as in the male of *irene* and unlike the majority of females as stated above. The alternative coloring of segment 8 in the female of *gracilis* mentioned above is seen in one specimen from Iona, New Jersey, July 13, 1902 (Daecke).

The transference of species from *Nehalennia* to *Ischnura*, mentioned in the first paragraph of this paper, indicates the difficulty of sharply distinguishing these two groups. Even now it does not appear to be possible to give any one character which will invariably separate them. The following statement may be of assistance:

Nehalennia. Prevailing color of dorsum metallic green. Second joint of antenna black, its middle third pale. Pale color on postero-superior part of head forming a transverse line whose extremities are not enlarged (except in ? *integricollis* male). M₂ on the hind wings separating from M₁ more often nearest the fourth postnodal. Males without an elevated, bifid, dorsal process on abdominal segment 10 (ap-

* *Farbenvarietäten der Agrionide Nehalennia speciosa* Charp. Mitt. schweiz. entom. Gesell. XI, pp. 159-165, 1906. Very recently this species has also been discovered in Asia by Bartenev, Zool. Anz. xxxv, p. 278, 1910; Ann. Mus. Zool. Acad. Imp. Sci. St. Petersburg. xvi, p. 447, 1912.

† Mr. Williamson kindly placed his collection of *Nehalennia* at my disposal for study.

proach thereto in *speciosa*), stigmata of front and hind wings similar in size, shape and color. Females without a vulvar spine.

Ischnura. Prevailing color of dorsum not metallic green. Second joint of antenna otherwise colored. Pale color on postero-superior part of head forming two round or cuneiform postocular spots sometimes united by a transverse line. M₂ on the hind wings separating from M₁ more often nearest the third postnodal (except in *I. erratica*, *I. cervula*, *I. inarmata* and possibly others). Males with an elevated, usually bifid, dorsal process on abdominal segment 10, stigmata of front and hind wings dissimilar in color, size or both (dissimilarity slight in *I. posita*). Females with or without a vulvar spine, in some cases even in the same species.

A new Erycinid from South America (Lepid.).

By LEVI W. MENGEL, Reading, Pa.

Chamaelimnas propinquus n. sp.

Expanse of spread insect, 1.38 in. *Male* (Fig. 1), upperside. Anterior wings, black. A broad orange band crosses the wing transversely, extending from the middle of the costa almost to the inner angle, cutting into the lowest median nervule. The band does not quite reach the costa. A sharp, triangular tooth-like projection of orange reaches from the transverse band, partially filling the space between the second and third subcostal nervules, extending entirely to the base of the wing, where the angle is quite acute. There is an iridescent steel-blue spot at the apex of the wing.

Posterior wing has the basal half steel blue; the outer half, black.

The *female* (Fig. 2) is much the same, except that the orange band is very much broader and the triangular projection extends to the base along the costa and completely fills the space to the fourth subcostal nervule. The iridescent spot in the apex is smaller and duller. The lower wing is the same as in the male.



Undersides of *both sexes*, the same as the upper side, but the orange band is duller, approaching yellow in color. Antennae, head, thorax, abdomen, and legs, black.

That the species is variable is shown by Fig. 3, where the orange, tooth-like projection does not pass quite to the base.

Habitat.—Neiva, U. S. Colombia.

Types.—Collection Mengel.

The species is close to *C. splendens* Grose-Smith, and may be the same, but the tooth of the orange band is very short in comparison with the species under discussion.

Descriptions of two new Species of the Dipterous Genera *Chaetopsis* and *Stenomyia*, with notes on other species.

By E. T. CRESSON, JR., Academy of Natural Sciences of
Philadelphia.

In working over some material for determination, two new species of *Stenomyia* were found and notes made of some species of *Chaetopsis* which may prove of interest to my colleagues.

The table given by Mr. C. W. Johnson, in his "Insects of Florida," (1) of the species of the genus *Chaetopsis* is very good and, I understand, is based upon natural specimens, not upon descriptions. However, the characters given for the separation of *C. aenea* and *fulvifrons* are somewhat inconstant, but if used with propriety will prove quite satisfactory. I have, however, found that the females are quite constant in their differently shaped sixth abdominal segments which I here figure in outline. I also give my idea of the most important characters for the separation of these species as well as of their synonymy.

The species herein treated may be separated as follows:

1. Front with distinct series of converging bristles which are much stronger than the proclinate orbital hairs; apical angle of anal cell prolonged; face but little retreating with epistoma somewhat prominent. (*Chaetopsis*)

(1) Bull. Am. Mus. Nat. Hist., xxxii, 83, 1913.

No distinct series of converging bristles, but all hairs and bristles subequal and proclinate; apical angle of anal cell with acute angle, but not prolonged; face distinctly retreating; epistoma not prominent. (*Stenomyia*)

2. Wings with three fuscus bands including that of apex; legs yellow
aenea Wied. and *fulvifrons* Mcq

For other species see Johnson's table.

3. Wings with base, apical half and cross band over stigma fuscous
fasciapennis

Wings hyaline with only an apical, no stigmal spot

nasoni

Wings with a stigmal and an apical band (See Johnson's table No. 5)

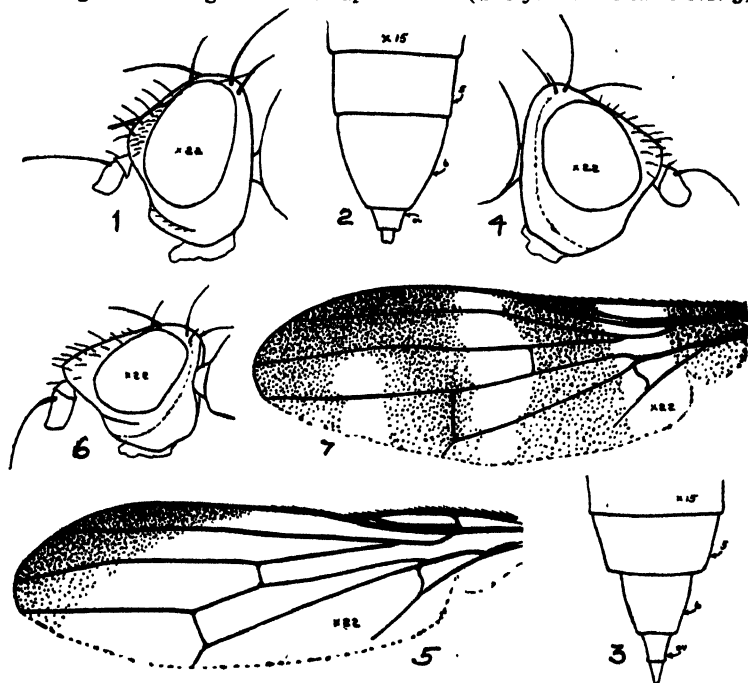


Fig. 1. *Chaetopsis aenea* Wied. Profile of head.
 " 2. " " Dorsum of fifth and sixth abdominal segments.
 " 3. " *trifasciata* Say. Dorsum of fifth and sixth segments.
 " 4. *Stenomyia nasoni*. Profile of head.
 " 5. " " Wing.
 " 6. " *fasciapennis*. Profile of head.
 " 7. " " Wing.

***Chaetopsis aenea*.**

1830, Wiedemann, Auss. Zw., ii, 462, (*Ortalis*).

1830 (August), Say, Jour. Acad. Nat. Sci. Phila., vi, 184, (*Ortalis trifasciata*).

Size ranging from 5.0-6.0 mm. The abdomen nearly black and contrasting with the metallic green of the thorax; legs rufous with the bases of femora sometimes darkened; frontal series of 4-6 bristles, with or without one or two median pairs of proclinate bristles above antennae. Wings with three brown bands which are generally as broad as, or broader than, their alternating hyaline spaces, the basal band dilating and attaining the inner margin more or less distinctly, the apical band generally always connected with the middle band along the costa and sometimes faintly along the inner margin. The flattened sixth segment of female abdomen as broad as, and nearly twice the length of, the fifth.

The synonymy of *Ortalis trifasciata* Say seems certain, although Osten Sacken in *Psyche* (2) accepts it only by reading Say's description in a certain way. In this he errs in thinking that Loew did not make his (Loew's) description and figure agree. Loew's description mentions the connection of the two apical bands along the costa while his figure shows only a clouding along the inner margin. No doubt Loew had this and the next species before him. Of course, there is some doubt as to whether this is Wiedemann's species, or, even Say's.

***Chaetopsis fulvifrons*.**

1855, Macquart, *Dipt. Exot.*, Suppl. v, 125, pl. vii, f. 8, (*Urophora fulvifrons*).

1831, Say, *Desc. Ins. Louisiana*, 19, (*Trypeta trifasciata*) (3).

1867, v. d. Wulp, *Tidj. v. Ent.*, x, 157, pl. v, f. 12-14, (*Aciura aenea*).

Similar to, but smaller than, *aenea* (4-5 mm.), with the abdomen more concolorous with the thorax; frontal bristles 2-4 without the median pair. Wings similar but all cross bands less intense and more evanescent towards inner margins, especially the basal band which is seldom noticeable beyond the fifth vein. Sixth abdominal segment of female much narrower and hardly longer than the fifth. The abdomen of male seems to be more pointed on account of the lateral margins being more revolute than those of *aenea*.

As the basal band of the wing is very much abbreviated in this species and sometimes the middle and apical bands are not, or seldom, connected along the costa, the above synonymy would seem to be correct. The name *trifasciata*

(2) *Psyche* viii, 308, 1899.

(3) See *Psyche* vii, 307, 1899, for this description republished.

being already used in the genus as a synonym of *aenea* Wied. the same had better not be used again here.

***Stenomyia fasciapennis* n. sp.**

Black, moderately shining with metallic steel color reflections. Rufous or yellow as follows: Front except ocellar region and vertical angles, sides of face, epistoma, cheeks, all opaque, antennae except fuscous apices, coxae, femora except below, extreme tips of tibiae, bases of tarsi, halteres, and veins of wings in hyaline areas. Wings fuscous with two complete hyaline bands as figured.

Robust. Head as high as long. Front as wide as eye, without differential frontal bristles, with numerous fine orbital hairs, in profile but little projecting beyond orbits. Face retreating, with scarcely any vibrissal angles. Cheeks .25 eye-height. Third antennal joint hardly longer than second and nearly as broad, with an apical angle of about 90 degrees. Chaetotaxy normal. Thorax and abdomen only slightly elongate, the latter not overreaching the wings. Wings with anal cell as figured. Length 4.0 mm.

Described from two males bearing a state label "Minn." without any other data. Holotype No. 6016 in the American Entomological Society collection.

These specimens were found in the collection under *debilis* Loew which they are certainly not. The species is a true *Stenomyia* and may be distinguished from its congeners by the wing design as well as being also much stouter.

Stenomyia Loew is considered by Dr. Hendel (4) as synonymous with *Chaetopsis* Lw. I cannot agree to this, for I find good characters of differentiation, supported by the new species here described which lead me to consider the genus valid, at least, recognizable, such as the absence of differentiated frontal bristles, the retreating face with no distinct vibrissal angles and the short anal cell. The genus seems to be more nearly related to *Eumetopiella* Hendel.

***Stenomyia nasoni* n. sp.**

Black, shining, metallic steel blue or greenish. Front opaque, dark rufous except at vertex, with whitish dust which becomes more intense along orbits. Sides of face and cheeks, also opaque and concolorous with front, with narrow orbits whitish; median part to epistoma shining steel blue. Antennae black, with whitish spot at apex of second.

(4) Wien. Ent. Zeit., xxviii, 254, 1909.

Halteres white. Apical segment of abdomen not metallic colored. Legs black, shining, steel blue tinged, with fore tarsi black, middle and hind tarsi yellow. Wings hyaline with fuscous marking as figured.

Elongate. Head longer than high. Front projecting forward, in profile, 0.5 horizontal diameter of eye beyond orbits, and overhanging root of antennae, as wide as eye; all frontal bristles hair-like. Face much retreating. Cheeks about as wide as third antennal joint. The latter twice as long as second. Thorax and abdomen elongate, the latter generally overreaching the wings. Anal cell short, as figured. Length 5.0 mm. (excluding ovipositor).

♂. Third antennal joint rectangular, rather sub-mucronate apically.

♀. Similar with third joint somewhat subconical and apical angle rather angular. Sixth abdominal segment twice as long as fifth and broader.

Described from 2 ♂, 1 ♀ from Algonquin, Illinois. Collected by Dr. Wm. A. Nason, June 28, 1908. Holotype and Allotype No. 6017 in the American Entomological collection.

This species resembles *tenuis* Lw. in its build except that the head is more elongate. Collectively it is more like *Eumetopiella rufipes* Lw. but may be readily separated by the submucronate antennae and the presence of well developed humeral and posterior dorsocentral bristles.

OBITUARY.

Rev. Dr. Isaac F. Stidham.

The Rev. Dr. Isaac Ferdinand Stidham, pastor of Falls of Schuylkill Baptist Church, Philadelphia, died June 9, 1913, in the parsonage adjoining the church, Queen lane above Ridge Avenue, Falls of Schuylkill.

Doctor Stidham was the son of Jonas and Anna Stidham, and was born November 26, 1837, in Baltimore. His father was a well-to-do farmer. After receiving an education in the public schools, Doctor Stidham entered Baltimore College, from which he was graduated in 1860. He then spent three years teaching in the college as professor of theology, and was ordained to the Baptist ministry in 1863.

His first charge was at the Falls of Schuylkill Church, where he began his labors March 1, 1868. In 1872, owing to impaired health and the advice of his physicians, he resigned,

being already used in the genus as a synonym of *aenea* Wied. the same had better not be used again here.

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His first charge was at the Falls of Schuylkill Church, where he began his labors March 1, 1868. In 1872, owing to impaired health and the advice of his physicians, he resigned,

to accept a call to the pastorate of the Baptist Temple, in Columbus, Ohio, where he spent twelve years.

While in Ohio he was given the degree of doctor of philosophy by Denison University, and the degree of doctor of laws by Columbus College. He subsequently spent twelve years as pastor of the First Baptist Church of New Britain, Connecticut. In the fall of 1897 he accepted a call to return to Falls of Schuylkill Church, and entered upon what proved his first and last field of labor, January 1, 1898.

Doctor Stidham was secretary-treasurer of the Philadelphia Baptist Ministers Conference, which recently elected him honorary secretary for life. He was widely known in the Masonic fraternity in which he was a thirty-second degree Mason. He was a member of Mary Commandery No. 36, Knights Templar.

In 1864 he was married to Miss Nannie Dutton, of Baltimore, who, with a son, Ferdinand Stidham, of Boston, and three daughters, Mrs. M. D. Stanley, of New Britain, Conn.; Mrs. Leonard Ritter, of West Philadelphia; Miss Edna Stidham; and four grandchildren survive.—*The North American* (Philadelphia), June 10, 1913.

Dr. Stidham was an enthusiastic amateur lepidopterist, and had a collection of exotic and domestic species. He was the discoverer of a new species of *Plagodis* which was taken at his home (Falls of Schuylkill), and named *schuylkillensis* by Mr. J. A. Grossbeck.—H. S.

Grasshopper Army Moving Eastward (Orthop.)

Roswell, N. M., June 3.—The column of grasshoppers which invaded Elida, a town in northeastern New Mexico, last week, has moved east and is continuing in a northeasterly direction, according to advices received here today. The pest destroyed most of the small gardens and lawns in Elida. The column is about 18 miles in width. Its progress is slow, the grasshoppers not having developed wings.

Sacramento, Cal., June 3.—From San Diego County, in the south, to Shasta, in the north, various sections of California are in the "grip of the grasshopper," and unless an extensive campaign of extermination is prosecuted by farmers and fruit growers heavy damage to some crops may result. This warning was given out today by State Horticulturist A. J. Cook after the receipt of reports of wide-spread attacks by the pests.—*The Public Ledger* (Philadelphia).

Fragments on North American Insects—V.

By A. A. GIRAULT, Nelson (Cairns), North Queensland,
Australia.

1. Hatching of a Mantid (Orthop.).

During the last day of January, 1904, I found several egg-cases of a mantid on a shrub in the suburbs of Houston, Texas. When the eggs hatched the young nymphs were still within the envelope and resembled, then, small pupae. The nymph leaves the egg head first, issuing in this case from a canal-like, prolonged end of the ootheca, and then lies quietly upon the side of the latter. Soon the envelope parts along the dorsum and is drawn over the head and then worked back from over the body by squirming movements, first the antennae and then the legs becoming free. When the last pair of legs are freed, the envelope then free from all of the body with the exception of the last two or three abdominal segments, the nymph turns over upon its back and pushes the latter off with the caudal tarsi. The hatching and casting of the envelope occupies about five minutes. When entirely free the nymph lies inert for about another minute and then suddenly darts up and away.

A case observed at 10 A. M., May 29, 1904, is worth recording. The pronymph was first observed lying upon its side upon the egg case. It then resembled a free pupa, the appendages extended along the sides, the tarsi projecting at right angles. The body was gently squirming until after a short while the envelope parted along the thorax and was with difficulty worked over the head; afterward it was very quickly, almost imperceptibly, slipped off the body like a glove from the finger. When the legs had been freed and the envelope adhering only to the last two abdominal segments, the nymph turned over upon its back, propped up by the knees of the first and second pairs of legs and, somewhat figuratively, kicked the enveloping integument off (not unlike the position of a man lying on his back propped up by the elbows and kicking with the

feet). The nymph simply pushed the envelope off with the posterior legs, squirming the body in the meanwhile and afterward giving a few active kicks with the legs. Shortly afterward, still lying, but in motion, the nymph suddenly gained its feet and quickly darted away. This ecdysis occupied only about four minutes. The nymph had become normally colored after two hours. It lived only a week in confinement without food.

This mantid was not any of the common species of the United States. The egg cases were rectangular, with the outer, upper end prolonged like a tuft. They were ochreous in color, with a median dark ridge; the lower end clasped the twig. They were about 19 mm. long and resembled somewhat the larvae of flannel moths.

2. *Adontea spinuloides*, var. *leucosigma* (Lep.).

One caterpillar of this species was obtained May 15, 1902, from apple at Blacksburg, Virginia. It was then about two-thirds of an inch long. After two molts it was an inch long and had the general appearance of a larva of *Hemerocampa*. On June 21 the larva commenced to construct a mat of silk upon which it again molted; on June 28, the same operations were repeated, the molt occurring on the afternoon of July 1. On July 15 feeding had practically ceased and on the following day a cocoon was commenced by fastening together several leaves. The cocoon was lined with the clothing of the caterpillar's body. The moth emerged on August 3, 1902, or after a pupal stage of about sixteen days. The chrysalis is stout, shining brown with tinges of reddish and along the dorsal aspect hairy, this pubescence being sandy in color and pilose. By way of markings, the chrysalis bears near the base of the abdomen dorsad two transverse rows of small masses of scalelike bodies arranged in three areas in each row. The cremaster ends in a peculiarly rugged knotlike process. The identification was made from the moth by Mr. Herman J. Erb, of New York City.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., JULY, 1913.

Entomology is a subject of vast and ever-increasing importance as the discoveries, made every year, of the influence of insects on human life, health, food, shelter and other possessions abundantly prove. Yet it is still unappreciated in many quarters, where, to apply Huxley's quotation from Dante, it is

put on cross so much,
Even by those who ought to give her praise,
Giving her wrongly ill repute and blame.

Those who still regard the study of insects as unworthy of human endeavor, or as indicative of a low degree of intelligence, we can triumphantly refer to the career of Sir John Lubbock, Lord Avebury, briefly sketched on another page of this issue. That many-sided man, "banker, humanitarian, man of letters, legislator, pre-eminent natural historian, did many things well," and could most fitly have borne the motto which Thomas Say adopted from Harris: "As there is no part of nature too mean for the Divine Presence, so there is no kind of subject having its foundation in nature that is below the dignity of a philosophical inquiry." If a Lubbock could devote a large part of his "patience and spirits of wine" to the investigation of a minute spring-tail, or concern himself with the behavior of an ant, no man with but a fraction of *his* genius or of *his* achievements can be justified in regarding an entomologist with contempt.

N. B.—No numbers of the NEWS are issued for August or September.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Limenitis ursula var. *albofasciata* Newcomb (Lepid.).

This variety was described and figured in *Psyche* 14, 90, pl. 2, figs. 7, 8, 1907. Mr. Newcomb claims this white-banded form is not a hybrid between *ursula* and *arthemis*, as it occurs where *arthemis* is unknown. He gives the following localities—Staten Island, Long Island, in New York; Jersey City, New Jersey; Boston, Malden and Wollaston, in Massachusetts. A large and handsome female of the variety has been captured at Chestnut Hill, Philadelphia, by E. M. Cheston. *Arthemis* has not been captured anywhere near Philadelphia. The nearest place to Philadelphia where *arthemis* has been taken, so far as I am aware, is Shady Brook, near Lopez, Sullivan County, Pennsylvania, by Mr. Witmer Stone. I think Mr. Newcomb is correct in his conjecture, that this is not a hybrid. If a female of this form is captured it would be most interesting to know what the progeny would be like. The form must occur rarely, as the territory of its habitat has been assiduously collected over for many years.—HENRY SKINNER.

A Specific Character in the Genus *Trichogramma* (Hymenoptera).

In Australia I have found a native species of *Trichogramma* lacking the cephalic line of discal cilia in the posterior wing, its characteristic. In the Sandwich Islands occurs a native species with the three lines long and complete. Other species common to Europe and North America are characterized by the relative incompleteness of one or more of these three lines of ciliation. On November 26, 1912, I received from Russia a number of females of a species of the genus, all of which lack the cephalic and caudal of the three lines, the middle line complete. I have reason to think that the arrangement of these cilia is one of the specific characters in the genus and that although these specimens are otherwise like the subcosmopolitan *minutum* of Riley, they represent a distinct species. I have, perhaps, studied more species and more specimens of this genus than any other hymenopterologist and yet must confess that I am still more or less uncertain in regard to whether this species is distinct. But since the evidence so far collected goes far to show that the minute differences noted above are real and of specific value, I cannot see any other way out than to consider the Russian specimens as a distinct species and the same as the species (*Pentarthron fasciatum*) recently described by Perkins from Mexico, reared from the eggs of *Diatraea saccharalis*. They agree with Perkins' description except that most of the specimens are immaculate, a few with a rather narrow dusky band across the base of the abdomen and the distal fifth of the same

region dusky. The oblique line of the fore wing (from stigmal vein, caudo-proximad) was incomplete, consisting of from 3-6 cilia, usually 5; the long single line of discal cilia of the posterior wing was cephalic, distad approaching the costal margin of the wing which was usually acuminate.

Thus, there is scarcely a species in the genus having the arrangement of these ciliated lines alike, while some of the species differ from others only in differences in their arrangement. On the other hand, coloration is very variable, even within the same generation of bred material. As a matter of record, I should state that the above specimens were received from the Poltava Agricultural Experiment Station.—A. A. GIRAULT, Nelson (Cairns), North Queensland, Australia.

Everes amyntula and comyntas (Lepid.).

Absolute characters! A hard thing. Methinks Dr. Skinner knew what he was asking for when he penned those two words.*

With two species as close as these species, that are evidently in the process of mutation, it is quite impossible to give absolute characters, but I think I can give general characters whereby the great majority of specimens could be easily identified; for ease of reference I will tabulate them in parallel columns.

<i>Amyntula.</i>	<i>Comyntas.</i>
Size: Larger, generally much larger.	Size, decidedly smaller. I have never seen a specimen as large as the average <i>amyntula</i> .
Shape: Wings decidedly broader, apex cauter, termen nearly straight.	Shape: Wings narrower, apex rounded, termen well arched.
Terminal border linear, generally finely linear, blackish.	Terminal border broadly blackish brown, often very broad.

Underside.

Color whitish with a marked white hoary appearance.	Color decidedly gray.
Spots in primaries are short dashes, rarely encircled, marginal rows obsolete.	Spots are distinct ocellated spots, marginal rows distinct.
Spots in secondaries very largely obsolete, ocellation scarcely ever visible.	Spots in secondaries, obsoletion very rare, ocellation distinct.

These are, of course, general characters, but they will certainly apply in the great majority of specimens. Dr. Skinner says that some points I got second hand. I think I stated that in my paper and thanked my friends for their kind aid, and now I am glad to heartily thank Dr.

*Ent. News, May, 1913, p. 230.

Skinner himself (whose personal acquaintance I had the pleasure of making at the Oxford International Congress last August) for clearing up a point that I had been entirely unable to trace on this side, viz.: the synonymy of *Lycaena tigua* Reakirt and *monica* Reakirt. I had quite come to the conclusion from a study of the description only that they had nothing to do with the genus *Everes*, but probably belonged to what we now call the Lampididae; Dr. Skinner has settled the point and has put on record that the types are known and are available for inspection, and that *Lycaena tigua* Reakirt is a synonym of *Catochrysops strabo* whilst *Lycaena monica* is a synonym of *Euchrysops cnejus*. This is an elucidation unknown, I believe, on this side the water, and I am glad to know it. It is by bringing forward these little points, as Dr. Skinner has done, that we move a step forward.

G. T. BETHUNE-BAKER.

Members of the International Commission of Zoological Nomenclature.

For the information of our readers we give a list of the members of the International Commission of Zoological Nomenclature of the International Zoological Congress, as communicated by Dr. Stiles.

Class	Name	Address.
1922—	Allen, Dr. J. A.,	Amer. Museum of Natural History, 77th St., New York.
1919—	Apstein, Prof. C.,	Zool. Mus. Invalidenstr, 43 Berlin, N. 4.
1922—	Bather, Dr. F. A.,	Brit. Mus. Natural Hist., Cromwell Road, London, England.
1919—	Blanchard, Prof. R.,	Pres. Ecole de medicine, Paris, France.
1922—	Dautzenberg, Ph.,	213 rue de Universite, Paris, France.
1916—	Hartert, Dr. Ernst,	Museum, Tring, England.
1919—	Horvath, Prof. Geza,	Mus. Nat. hongrois, Budapest, Austro-Hung.
1922—	Hoyle, Dr. Wm. Evans,	National Museum, Cardiff, Wales.
1916—	Jentink, Dr. F. A.,	Museum, Leiden, Holland.
1916—	Jordan, Pres. David S.,	Stanford Univ., Palo Alto, Cal., U. S. A.
1922—	Jordan, Dr. K.,	Tring, England.
1922—	Kolbe, Prof. H. J.,	Zool. Mus. Invalidenstr 43, Berlin, N. 4.
1916—	Monticello, Prof. F. S.,	Inst. Zool. R. Univ. Napoli, Italy.
1919—	Roule, Prof. Louis,	Museum Nat. Hist., Paris, France.
1916—	Schulze, Gehm. Prof. Dr. F. E.,	Zool. Mus. Inval., 43 Berlin, N. 4.
1916—	Skinner, Dr. Henry,	Philadelphia, Pa. (Acad. Nat. Sciences).
1916—	Stejneger, Dr. L.,	Nat. Mus., Washington, D. C., U. S. A.
1919—	Stiles, Prof. C. W.,	Secretary. Permanent, Hygienic Laboratory, 25th & E. Sts., N. W., Washington, D. C.; Temporary, U. S. Marine Hospital, Wilmington, N. C., U. S. A. (1913-1914).

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in Heavy-Faced Type refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues, which are generally dated the year previous.

All continued papers, with few exceptions, are recorded only at their first instalments.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

1—Proceedings, Academy of Natural Sciences of Philadelphia.
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MIMIKRY UND VERWANDTE ERSCHEINUNGEN VON DR. ARNOLD JACOBI, Direktor des Königl. Zoologischen Museums in Dresden. Braunschweig, Friedr. Vieweg & Sohn. 1913. 12mo. pp. ix, 215. 31 text figures, some colored. In paper covers 8 Marks, in linen binding 8 M. 50 pf.

This is volume 47 of "Die Wissenschaft," a series of small monographs in natural science and technology, issued by the publishers named. Its plan is thus stated in the preface: "The subject of mimicry has the greater claim to be represented in this collection because neither German nor foreign literature possesses a comprehensive and critical treatment of it corresponding to our present knowledge. Whoever seeks information in this direction must go either to the older books or to newer ones which have hardly been based on original sources and supply no literary references. I have been concerned to work over all the writings of any importance for mimicry, in the sense in which I have accepted it, and have attempted to offer these fruits of many years of often far-reaching study to the reader in such a form as will not only acquaint him with the main features of the great store of facts and their significance, but also furnish him with a basis for drawing his own conclusions. Space permits indeed only a very limited choice of material which is in no proportion to the abundance of that which has appeared, especially in English and which is difficult to arrange, yet I have tried to help him who wishes more by careful references to the sources of information, based almost always on personal and careful knowledge of them. . . . In the allotment of material I held it advisable to give more space to the less known topics, such as the mimicking of ants, because they appear to me more certain and more susceptible of direct proof than the deceiving mimi-

cry of the Lepidoptera which often rests on weak supports. My own attitude toward the latter is to be seen in the concluding section."

The author's starting points are the variation in colors of animals, the close relation between color and the conditions of life, all color variations not necessarily useful, but some kinds may be so (p. 3), and thus the contents of the book are grouped under the four headings of: I. Schutzfärbung (protective coloration). II. Schützende Aehnlichkeit (protecting resemblance). III. Warnfärbung (warning coloration) and IV. Mimikry oder schützende Nachäffung (mimicry or protecting mimicking). To these four chapters are devoted 7, 34, 17 and 141 pages respectively. "Schutzfärbung" is the assumption by an animal of the color only of its surroundings; "schützende Aehnlichkeit" involves both color and form of the environment. The looseness with which many writers have employed the term mimicry is justly condemned and the original meaning is emphasized as "the protecting resemblance to avoided animals of other animals dwelling in the same place." (p. 64).

After general consideration of mimicry in vertebrates, spiders and insects, special sections are devoted to "Sphecoidie," or mimicking of stinging Hymenoptera; "Myrmecoidie" or the mimicking of ants; the mimicking of beetles; mimicry among Lepidoptera; and the general characteristics of mimetic Lepidoptera.

The examples cited throughout the book, while not limited to insects, are largely drawn from that class. Although a four page bibliography is given at the conclusion of the text, many other references to papers of less importance appear in the footnotes all through the work. Various theories, as natural selection, orthogenesis, are considered in their explanations of color phenomena. The author will not accept the views of Weismann in their entirety, nor does he hesitate to criticise the exponents of both opposed schools of interpretation of the value of colors, such as Professor Poulton and Mynheer Piepers. He concludes that "the theory of protecting adaptations by color and form has probability" (p. 42), and inclines "to explain the theory of mimicry in relation to Lepidoptera as a disproved hypothesis, a great, although also scientifically highly fruitful, error of nature-investigation" (p. 199).

Dr. Jacobi's book seems to have achieved the object which he sets forth in his preface in an excellent and very useful way.—P. P. C. (*Advertisement*).

We are requested to state that Mr. A. G. Scorsers' *Entomologists' Log-Book and Dictionary of the Life-Histories and Food Plants of the British Macro-Lepidoptera*, noticed in the News for June, page 285, may be obtained in the United States from E. P. Dutton & Co., 681 Fifth Avenue, New York. (*Advertisement*).

Doings of Societies.

FELDMAN COLLECTING SOCIAL.

Meeting of March 19, 1913, at 1523 South Thirteenth Street, Philadelphia. Ten members present; Mr. H. L. Viereck, visitor. President Haimbach in the chair.

Mr. Viereck described the system now used in the U. S. National Museum for arranging the insect collection. Cork-lined trays of various sizes are used for each species, so that when rearranging takes place an entire species can be handled at one time instead of only one specimen as heretofore.

Mr. Wenzel, Sr., described the routine work of his collection and exhibited two boxes of Hydrophilids wonderfully mounted and arranged by Mr. Wenzel, Jr. This led to a general discussion on collections and collectors, mostly the latter. Adjourned to the annex.

Meeting of April 16, 1913, at 1523 South Thirteenth Street, Philadelphia, Pa. Twelve members present; Mr. H. L. Viereck, visitor. President Haimbach in the chair.

Mr. Wenzel exhibited two specimens of *Rhyacionia wenzeli* Kearf. (Lep.), bred April 15 and 16, 1913, from the pitch swellings made by these insects on Virginia pine, *Pinus virginianus* Miller, which had been found at Red Bank, New Jersey.

Mr. Daecke recorded a specimen of *Clerus ichneumonaeus* Fabr. (Col.) collected at Rockville, Pennsylvania, March 30, 1913, hibernating under bark, and said this was most likely an adult from last year.

Mr. Harbeck exhibited the species of *Exoprosopa* (Dip.) which are in the New Jersey list, and with them a specimen of this genus from Surf City, New Jersey, August 23, 1911, entirely different.

Mr. J. W. Green exhibited some walking sticks from Santa Marta, Colombia, collected by himself December 26, 1910. These were more peculiar looking than our local form and also have short antennae.

Mr. Geo. M. Greene exhibited a male of *Mutilla stenosoma* Fox (Hym.) from Loggerhead Key, Dry Tortugas, Florida, July 8, 1912, from the Rehn and Hebard material. This is the second specimen known, the type being in the collection of the American Entomological Society.

Mr. Viereck said he had caught two Scolytids flying two weeks ago under a hemlock along the Wissahickon.

Adjourned to the annex. GEO. M. GREENE, Secretary.



ABNORMAL WING FORMATIONS.—RAU AND HOSENFELT.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXIV.

OCTOBER, 1913.

No. 8.

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Abnormal Wing Formations in *Samia cecropia* and *S. californica* (Lep.).

By PHIL RAU and GEO. H. HOSENFELT, St. Louis, Mo.

(Plate XI)

A female *Samia cecropia*, having a fifth wing emerged from its cocoon on May 6, 1904. This cocoon was one of a lot of forty which were taken in the southwestern part of St. Louis.

The figure makes any further description superfluous excepting that the supernumerary wing is in no way connected with the normal one, and the attachment of the wing to the thorax is quite independent of the others. This wing is an exception to those usually recorded in that it is only slightly aborted. This female differs from the male of the same species recorded by Bateson in that this supernumerary wing is a complete repetition of the left secondary wing, markings and all, whereas the one Bateson* records

* Materials for the Study of Variation, p. 283.

(quoting Strecker) is a repetition of only the anterior part of the left primary wing.

It would be well to record abnormal wing formations since Bateson tells us, "In some cases the extra wing is a close copy of a normal structure; in others it seems to be more or less deformed. No genuine case of an extra wing present on both sides of the body is known to me."

The upper illustration showing the ocellar marking on the left fore-wing of *Samia californica* is of an insect which came from Sonoma County, California. This male emerged on May 30, 1912, and was normal in every respect excepting the "eye-spot" in the left primary. This spot is a hole in the insect's wing, the periphery of this hole being white, edged off with a small band of brown. It was at first thought that the insect had met with an accident, but since the color was displaced and the edges around the hole were not broken but smoothly finished off, we concluded it must have acquired this condition before leaving the cocoon. Bateson, who goes into details concerning the eye-spots in Lepidoptera, mentions no case in any of his citations showing a similar condition of wing formation.

Fragments on North American Insects—VI.

By A. A. GIRAULT, Nelson (Cairns), North Queensland,
Australia.

1. The Effects of the Partial Amputation of the Antennae (Lep.).

Several times in June, 1902 and 1903, I removed most of the antennae from one or two specimens of Bombycid, Agaristid and Arctiid moths by snipping them off near base with scissors. The remaining stumps were usually not more than an eighth of an inch long. The effect seemed to be that the mutilated moths became quite helpless but active. The flight was irregular and all locomotion tended to be circular or one-sided; if one stump was longer it seemed to have more control, the movement being in relation to it and probably causing the circular flight. In one moth, the stumps were in constant movement and the insect appeared to be trying

to make the fore legs function as antennae and once the maxillae.

2. The Occurrence of *Heliothis obsoleta* (Fabricius) in North Queensland (Lep.).

Early in April, 1912 (April 10), I hastily examined a field of corn near Nelson (Cairns District), North Queensland, Australia, and found it badly infested with the cotton boll-worm of the Southern United States and elsewhere. The injury to the ears was characteristic and such larvae as were found could not be mistaken by one familiar with the young of the species. Several eggs were also found on the silk. The occurrence is worth recording, since the insect, I believe, has never been recorded from this region, though known years since to occur in the southern portions of the state. The caterpillars found were in stadia II and IV. Most of the corn was about half mature, referring to the ears, the plant long since grown. A week later, the insect was observed in another field of Indian corn growing among sugar cane, five miles nearer Cairns. It is well established in North Queensland, evidently, but I did not see it in a cotton field visited for a short while.

3. Fragments on *Ichthyura inclusa* var. *palla* (Lep.).

Colonies of the caterpillars of this species at Blacksburg, Virginia, were obtained from willow, June 28, 1902. The nests containing a colony usually surrounded two slender twigs with their foliage. The colonies were combined and fed, all in one rearing-cage. On July 9, after several days of neglect, all of the caterpillars attempted to pupate, though most were certainly not fullgrown. The action was obviously an adaptive one. The cocoons were constructed between two leaves or else merely in the web of the nest. Very few of the larvae succeeded in changing themselves. On July 19, the moths commenced to appear and they were transferred to another cage in order to mate them. On July 21 a pair were observed mating, the female above, hanging from the top of the cage by her conspicuous fore legs, the male hanging head downward from the tip of the abdomen of the female, the

two held together by the claspers only; the act occupies an hour or more. The following day (July 22) eggs were found; at first these are pinkish, changing as the embryo reaches perfection to purple, or rarely, a bright orange or red; just before hatching, they are lavender in color. The mass noted above hatched early in the morning of August 5, or after about fourteen days plus. Ichneumonoid parasites of the larva were common.

Hatching in this species occurs by means of eating a rounded piece out of the top of the egg. One female deposited two masses of eggs totaling a hundred and thirteen. On July 14, 1902, a colony was taken from cottonwood or Carolina poplar.

4. The Occurrence of *Acronycta hamamelis* in Virginia (Lep.).

Larvae of the species were captured from oak, August 26 and September 2, 1902. A larva captured on the first date made a cocoon early in September.

5. The Number of Pteromalids From a Single Chrysalis (Hym.).

At Blacksburg, Virginia, May 21, 1902, two parasitized chrysalids of *Basilarchia archippus* Cramer were given to me by Professor William B. Alwood. The pteromalids emerged on May 28. From one chrysalid, there were obtained three hundred and seventy-five. The species was probably *Pteromalus graptae* Howard, though it is not sure.

6. Hidden Aphid Eggs (Hemip.).

Once when I was examining an eggmass of *Malacosoma americana*, the well-known black eggs of a species of Aphidae were found hidden in the spaces between the eggs of the bottom of the mass, or that part of the mass which was next to the twig. Subsequently numerous cases of this kind were observed. The tree was apple, Blacksburg, Virginia, February, 1903. Since the overwintering eggs of the aphids are not deposited until late in the autumn and the overwintering eggs of the moths, months previously, early in summer, it is a mystery how the aphid eggs were thus deposited.

7. *Trypeta polita* Loew (Dip.).

The small, roundish galls of this dipteran are found during the winter in Virginia on composites. The interior of the gall is pithy and may contain two larval cells, though I be-

lieve one is the usual number. A number of galls collected from *Solidago* in the winter of 1903 yielded the adult flies on May 13 and 15. A eurytomid also appeared. The fly was identified by Coquillett. The exit-hole is large and round.

8. Number of Chalcidoid Parasites from Arctiid Pupae (Hym.).

Three arctiid pupae were found at Blacksburg, Virginia, June 25, 1902, under fence rails lying upon the ground. All were parasitized. From one, a hundred and fifteen parasites emerged, while from a second only forty-four. The other was lost. Neither host or parasite is known.

9. The Fowlbug, *Cimex columbarius* Jenyns (Hemip.).

An adult of this relative of the common bedbug captured in a henhouse at Anacostia, District of Columbia, September 24, 1905, and placed within an ordinary physician's pillbox, retained its normal color until death occurred on March 31, 1906. It was not fed and lived in captivity a hundred and eighty-eight days without nourishment. It was recently fed when captured and of the female sex. Another female was captured at the same time, and similarly kept; it died about the middle of December following. Both were alone. The second female produced seven young, which hatched by October 11. A third adult died a few days after capture, though it had been fed once upon recently born mice (*Mus*). A nymph (fifth stage) captured with the others molted to adult on September 29 and died on October 7, 1905; it was not fed.

Three nymphs of the first stage were fed on human blood by giving them access to a lower portion of the fore-arm, November 15, 1906:

1. Began feeding at	I:17½	p. m.
First blood entered	I:19	p. m.
First blood entered abdomen	I:25	p. m.
Ceased feeding, wholly colored	I:26	p. m.
Commenced again	I:27	p. m.
Ceased, about half gorged	I:30	p. m.
2. Began feeding	I:44	p. m.
First blood entered	I:44½	p. m.
First blood entered abdomen	I:44¾	p. m.
Ceased feeding, gorged	I:47	p. m.
3. Began feeding	I:37	p. m.
Ceased. gorged	I:30	d. m.

Upon comparing the first larval stages of *columbarius* and *lectularius* the following were found: the coloration is the same, the structure appears to be identical in both, the antennae are four-jointed, the distal two joints long and slender, the distal joint longest, the proximal joint very short, the second joint about half the length of the third, but stouter; tarsi two-jointed, the first joint very short. Thus, the adult differences do not hold for the young larvæ.

10. Coccinellids Probably Feeding upon Foliage (Col.).

On March 19, 1904, Mr. F. C. Bishopp showed me adult specimens of *Megilla maculata* and *Coccinella sanguinea* taken at Greenville, Texas, and which he thought had been feeding upon the foliage of a *Rumex*.

11. Occurrence of the Phorid *Trineura aterrima* Fabricius in Texas (Dip.).

At Paris, Texas, March 17, 1904, I captured a single specimen of this phorid while using the sweeping net in meadows. The species was identified by Brues.

12. The Effect of the Local Climatic Variations Upon the Daily Activities of Some Insect Groups (Col.).

Entomologists are very familiar with the fluctuating luck with which sugaring for moths is attended and those who have paid even casual attention to collecting beetles at lights, or to the jarring of trees at nights for scarabaeids, must have noticed the same thing. It is a matter commonly experienced, that, even in the height of the season's activity, some days or some nights are much better for purposes of observation, without any apparent reason for it, other than it is clear or cloudy or still or windy, or sultry or not, dark or the moon shines. Sometimes, even at what are taken to be ideal times, disappointment follows. The species of *Lachnosterna* seem to be especially susceptible to any slight climatic changes and on nights when they are expected in numbers, never appear. I had frequently noticed this when collecting these beetles from their foodplants, night after night. At lights, also, I have seen them very abundant when least expected, on rather cool evenings for instance. Since the activity of many nocturnal insects commences during twilight or at dusk, it has often

occurred to me that the conditions prevailing then shape the subsequent activities, at least in many cases. These one or two facts bearing on the general question were casually noted in regard to the contents of a lantern trap placed in a cotton field near Paris, Texas, in 1904: Three out of four evenings noted were warm, dark and still, (May 2, 11 and 15) and the beetles of the genus *Lachnosterna* were abundant, forming most of the trap contents; the fourth evening (May 14), the beetles were absent, only small species of Lepidoptera being caught in numbers. The day was clear and pleasant, but the evening cool. The lower evening temperature and greater light here are indicated. The maximum temperature this day was about seven degrees lower than that of the other three days, but the minimum was half a degree higher than that of May 15. The three days on which they were abundant were each warmer than the preceding day and the evenings dark. The patent fact shown is that the activity of these beetles was fluctuating, true also for the Lepidoptera, abundant some of the nights, at others scarce or absent altogether.

13. The Death Feigning Habit of *Trox*. (Col.).

Specimens of this genus which I captured under the skin of some animal lying upon the ground in a wood near Paris, Texas, March 6, 1904, at once assumed a death-feigning attitude as soon as disturbed. They remained perfectly still, the legs drawn in close to the body and rigid, the beetles upon their backs. Their extraordinarily hard bodies and curious form, combined with an association of brittleness which one obtains by looking at them, are heightened by the rigid attitude assumed in the first movement. They certainly do not appear especially nourishing at any time.

14. The Extraordinary Tenacity of Life in an Elaterid, as Compared with other Insects. (Col.).

A large elaterid of the genus *Alaus* was captured at Houston, Texas, from a concavity in a stump where it was hibernating, January 30, 1904. It was placed in a cyanide bottle and upon my return to Paris, pinned and labeled in the usual

way. Later, however, it was found to be still alive and had to be "rekilled" in the cyanide and repinned one or two times. On March 1st, it was found necessary to place it in the cyanide bottle a fourth time, but even after fifteen hours exposure, life was still evident (at this time the bottle readily killed a cerambycid and *Benacus*). By noon, March 2, it was apparently dead and was repinned and placed in the cabinet. For several days it exhibited no signs of life; but on March 7, it was livelier than ever. On March 8 it was exposed to the cyanide for thirty-one hours and died apparently, since no other note concerning it was made. This is an illustration of marked advantage in resistance of one species over many others when exposed to adverse (but unnatural) conditions.

The Butterflies of Omaha, Nebraska (Lepid.).

By R. A. LEUSSLER, Omaha, Neb.

Omaha, Nebraska, is situated on the eastern margin of the State, on the bank of the Missouri River, in latitude 41 deg. 16 min. Being geographically near the center of the United States, this locality presents perhaps a rather varied butterfly fauna. The surface of the country bordering the river originally consisted of heavily wooded bluffs cut into by deep ravines at many places, with some low-lying, timber-covered bottom land between the bluffs and the river. The original surface has, of course, been greatly altered in the city itself, but in the suburbs to the north and south much of the wooded bluffs remain. This woodland strip extends westward from the river for a distance of perhaps three miles, where it shades off into rolling prairie. The bottom land has mostly been cleared and turned into meadow. The principal native trees are oak, ash, walnut, elm, ironwood, hackberry, basswood, redhaw, willow, boxelder and cottonwood, while some of the native shrubs to be found are hazelnut, gooseberry, currant, wild plum, choke cherry, prickly ash, sumac, burning bush, bitter-sweet, elderberry and wolfberry. Wild grape and poison ivy

also abound. The climate may be said to be one of extremes; the summers are usually hot and the winters often severe. An idea of the extremes can be gained when it is stated that in July, 1911, the Government weather bureau recorded a temperature of 107 degrees, and in January, 1912, 27 degrees below zero—a range of 134 degrees within 6 months. The average annual precipitation is about 31 inches, by far the greater part falling between April and August. High winds are common and many an otherwise perfect day is utterly spoiled for butterfly collecting by a stiff wind, causing butterflies to hide in shelter.

The writer has spent five years collecting in this locality, and as he does not find that anything has been written concerning the butterflies to be found here he gives the following list as embracing the species found on the Nebraska side of the river in the immediate vicinity of Omaha.

The classification used is that found in Dyar's List of N. A. Lepidoptera (Bull. 52, U. S. Nat. Museum), and reference was had to the following works in arriving at identifications: The Butterflies of North America.—W. H. Edwards. Butterflies of the Eastern U. S. and Can.—S. H. Scudder. The Butterfly Book.—W. J. Holland. Everyday Butterflies.—S. H. Scudder. The Butterflies of the West Coast.—W. G. Wright. The Butterflies of Montana.—M. J. Elrod. A Review of the Hesperiiidae of the U. S.—H. G. Dyar. The Boreal Am. Species of Chlorippe.—Hy. Skinner. Entomological News, Canadian Entomologist, and original descriptions of species from various publications.

Access was also had to the collection of the University of Nebraska and to the private collection of Dr. Robt. H. Wolcott, of Lincoln, Neb., the latter also kindly assisting in making identifications.

1. *Iphiclides ajax*, var. *telamonides* Feld.—A single specimen, Apr. 3, 1910.

1-a. *Iphiclides ajax*, var. *marcellus* Bd.-Lec.—Rare; occasionally found during late June and July.

2. *Papilio daunus* Bd.—A single specimen taken by Dr. R. H. Wolcott May 1, 1910, while collecting with myself, and identification is positive.

3. *Papilio glaucus* Linn.—Black females can invariably be found during May and June; occasionally also during August.

3-a. *Papilio glaucus*, var. *turnus* Linn.—Common; first brood appears late in April, flies throughout May; second brood appears middle of July; flies throughout August.

4. *Papilio thoas* Linn.—Common; first brood, May and June; second brood, August.

5. *Papilio polyxenes* Fab.—Common; first brood, May and June; second brood, Aug. and September.

6. *Laertias philenor* Linn.—Not common, although both larvae and mature insects have been taken. First brood, July; second brood, October.

7. *Tachyris margarita* Hüb.—A single tattered specimen taken Aug. 25, 1909, following ten days of steady southeast wind. Clearly a straggler. Specimen is a male and has the stiff brush-like clusters of hairs attached to the abdominal clasps, leaving no doubt as to identification.

8. *Pontia protodice* Bd.-Lec.—Very common; on the wing from May to October.

8-a. *Pontia protodice* var. *vernalis* Edw.—Not common; found in May and sometimes in October.

9. *Pontia rapae* Linn.—Exceedingly common; found everywhere and at all times from March till October. A few specimens have been taken in early spring which approach var. *immaculata* but have one black spot on under side of primary.

10. *Nathalis iole* Bd.—Very plentiful, sometimes actually swarming; apparently two broods, first usually appearing early in July and second, early in September.

11. *Callidryas eubule* Linn.—Some years fairly abundant, other years rare; appears usually about Aug. 20 and flies till the end of September.

12. *Zerene caesonia* Stoll.—Fairly common in Aug. and Sept., and sometimes single individuals are found in May.

12-a. *Zerene caesonia*, var. *rosa* McNeill.—Some specimens of this variety found in Sept. and Oct.

13. *Eurymus eurytheme* Bd.—One of our commonest butterflies; typical form found principally from June till October, some albinos (♀) found mostly in September.

13-a. *Eurymus eurytheme*, var. *ariadne* Edw.—3 specimens (2 ♂, 1 ♀) taken which appear to be this form; they closely resemble the figures in Holland's Butterfly Book, but do not have the orange patch as distinctly defined as the illustrations in Edwards' Butt. N. A.

13-b. *Eurymus eurytheme*, var. *eriphyle* Edw.—This form is not common here, but is found from August till October.

13-c. *Eurymus eurytheme*, var. *keewaydin* Edw.—This form is quite common. May & June.

14. *Eurymus philodice* Godt.—Common; several broods; May till October.

14-a. *Eurymus philodice*, var. *luteitincta* Wolcott.—Two specimens taken June, 1910, and identified by Dr. Robt. H. Wolcott, who originally described this variety from Batavia, Ill., and Grand Rapids, Mich.

15. *Pyrisita mexicana* Bd.—Present in fair numbers late in September and early in October.

16. *Eurema nicippe* Cram.—One specimen taken by Mr. F. H. Marshall, June 18, 1910—one ditto June 3, 1911. Both somewhat worn.

17. *Eurema euterpe* Men.—Common; apparently two broods, the first making its appearance about the middle of July, the second about the first of September.

17-a. *Eurema euterpe*, var. *alba* Streck.—Occasionally some females of this species are found which are very pale, almost white.

18. *Colaenis julia* Fab.—A single specimen (♂) taken Sept., 1908, while settled on *Zinnia*, in her garden in Omaha, by Mrs. W. B. Graham. Specimen is now in the writer's collection, is somewhat rubbed, but colors are fresh and it is not tattered as though it had traveled a long distance. It is more likely that it was introduced, as larva or chrysalis, with a shipment of tropical fruit.

19. *Agraulis vanillae* Linn.—A number of larvae (60 or 70) of this species found feeding on passion vine in his garden by Mr. F. H. Marshall and some of them reared to imagoes. This vine was grown from a slip taken from a parent vine which had been growing in the greenhouse of an Omaha florist for several years, making it certain that the eggs were deposited by a female flying here at Omaha.

20. *Euptoicta claudia* Cram.—Common; found on the wing in every month from May to October; fresh specimens are most numerous in July and September, indicating two broods.

21. *Speyeria idalia* Dru.—Quite abundant; appears usually about the middle of June and remains on the wing until the middle of September, although there is but one brood.

22. *Argynnis cybele* Fab.—Our common *Argynnis*; also single brooded, its season being about the same as the foregoing.

23. *Argynnis aphrodite* Fab.—Extremely rare, but one specimen having been taken here. That one was taken by Mr. F. H. Marshall, Aug. 26, 1912.

23-a. *Argynnis aphrodite*, var. *alcestis* Edw.—Very rare; one capture by Mr. F. H. Marshall, July 24, 1909, and one by the writer, July 20, 1912.

24. *Brenthis myrina* Cram.—Plentiful in some years and not found at all in others, though searched for in the same places. Apparently triple-brooded, as fresh specimens have been taken in May, July and September. All specimens taken here are considerably larger than figured in Holland's "Butterfly Book" and Scudder's "Everyday Butterflies." The figures cited show an expanse of 40 & 42 mm. respectively, while the Omaha specimens have an expanse of 54 to 56 mm. in the case of males and 60 mm. in the case of females.

25. *Charidryas nycteis* Doubl.-Hew.—Fairly common; two broods; one in June, the other in August.

26. *Charidryas ismeria* Bd.-Lec.—Rare at Omaha, although a short distance west it is found abundantly.

27. *Phyciodes vesta* Edw.—A single specimen (♀) taken July 14, 1912. Upper side is identical with fig. 18, Pl. XVII, Holland's "Butterfly Book," while both upper side and under side agree with figures of summer form shown in Edwards' "Butt. N. A."

28. *Phyciodes tharos* Dru.—Common in May, but not as plentiful as var. *morpheus* is later in the season.

28-a. *Phyciodes tharos*, var. *morpheus* Fab.—Very common; on the wing from July till October.

29. *Anthanassa texana* Edw.—But two specimens taken; one (♀) by Mr. F. H. Shoemaker, Mar. 27, 1910, one (♂) by the writer, Sept. 14, 1911; both are fresh specimens. Explaining the early date of the 1910 capture, it should be stated that abnormally warm weather prevailed during the latter half of March of that year, bringing butterflies out about three weeks earlier than usual.

30. *Polygonia interrogationis* Fab.—Common; flies from the middle of August till October, then hibernates.

30-a. *Polygonia interrogationis*, var. *umbrosa* Lint.—Common; flies from latter part of May till July.

31. *Polygonia comma* Harris.—Common; appears early in Sept. and flies till freezing weather, when it hibernates and flies again early the following spring.

31-a. *Polygonia comma*, var. *dryas* Edw.—This form is found from the middle of June till the end of July, but is not nearly as numerous as the preceding.

32. *Euvanesa antiopa* Linn.—Common; two broods, first appearing the latter half of June; second, the middle of August, the latter hibernating.

33. *Vanessa atalanta* Linn.—Very common; several broods, the insect being on the wing from April or May till October.

34. *Vanessa huntera* Fab.—Some years fairly common and other years not found at all; flies from May till October.

35. *Vanessa cardui* Linn.—Common in most years, but scarce in others; several broods for it can be found from April till October.

36. *Junonia coenia* Hüb.—Can usually be found late in August and throughout September, but is also found in June and July, so there must be two broods.

37. *Basilarchia astyanax* Fab.—Common; found from the middle of June till the middle of September. Two broods, the second making its appearance about the middle of August.

38. *Basilarchia archippus* Cram.—Common; two broods; seasons nearly the same as the foregoing species.

39. *Chlorippe celtis* Bd-Lec.—Fairly common; two broods; first, in June; second, in August.

40. *Chlorippe clyton* Bd-Lec.—Not as common as *celtis*, but larvae in goodly numbers can be found on hackberry early in June, some of them nearly full grown and others still quite small. There is only one brood, but though the first butterflies emerge from chrysalids before the middle of June, others continue to emerge until past the first of August. The earliest emerging butterflies are *clyton-clyton* or *ocellata* of Edw. and as the season advances the later emerging ones become darker and darker, until those coming, say after the middle of July, are form *proserpina*. I have bred this species several seasons and have obtained all gradations from true *clyton* to true *proserpina*.

40-a. *Chlorippe clyton*, var. *proserpina* Scud.—As stated above, the later appearing *clyton* are of this form and there are pretty nearly as many of one form as of the other.

41. *Chlorippe flora* Edw.—One specimen emerging from chrysalis, June 12, 1911, agrees with figures of *flora* in Edwards' "Butt. N. A." and with Edwards' description of *flora*, also with specimens in the Strecker collection labeled *flora*. The larva of this one was collected along with a number of *clyton* larvae and I cannot recall that it was markedly different. It is possible that *flora* is only an extremely light form of *clyton*.

42. *Anaea andria* Scudd.—Neither very rare nor yet common; flies in October, hibernates and flies again in spring. More easily found in the spring than in autumn.

43. *Cercyonis alope*, var. *nephele* Kirby.—Common; the form found here is Edwards' *olympus*; single brooded; last half of July till past middle of August.

44. *Enodia portlandia* Fab.—Not very common; usually found the last half of June and the early part of July, but in some years appears to be double-brooded, for in 1910 fresh specimens were taken, June 14 and 18 and again on August 20 and Sept. 5. In 1912 fresh specimens were taken, June 22 and 26 and on September 19 a fairly fresh specimen (♀) was taken.

45. *Satyrodes canthus* Linn.—Very local, having been found in only one locality—a spring-fed marsh—so far. Appears early in July. What is true of *B. myrina*, as to size, is true of this species, the Omaha specimens are considerably larger than those illustrated by Holland and Scudder. The butterflies illustrated show an expanse of 48 to 50 mm. and I have specimens from Michigan which are no larger, while the Omaha specimens, both male and female, have an expanse of 60 mm. They are also quite dark.

46. *Cissia eurytus* Fab.—Common; single brooded; appears late in June, sometimes not till after the first of July. This is a full month later than its appearance in New England according to Scudder.

47. *Anosia plexippus* Linn.—Very common; can be found any time from May till freezing weather.

48. *Hypatus bachmanni* Kirtl.—Found occasionally, but not common; several mature insects taken and one larva found on hackberry and reared to imago. The latter emerged June 14, and mature insects found on the wing early in July.

49. *Uranotes melinus* Hüb.—Fairly common in some years and extremely rare in others. Has been taken here in every month from May to October, though there are probably only two broods.

50. *Thecla edwardsii* Saund.—One specimen taken by Mr. F. H. Marshall, but date of capture lost.

51. *Thecla calanus* Hüb.—A single specimen taken July 5, 1912.

52. *Strymon titus* Fab.—Not observed at Omaha prior to 1912, but in July of that year it appeared in fair numbers; observed in different localities July 3, 5, 10, 14 and 20 and altogether about 20 specimens taken.

53. *Feniseca tarquinius* Fab.—Rare; 5 specimens in 5 years in 3 different localities. Taken in April, June, September and October.

54. *Gaeides dione* Scud.—Not very common; single brooded, appearing about June 20.

55. *Chrysophanus thoe* Bd.—Usually pretty common; double brooded, appearing about June 15 and again early in August.

56. *Cyaniris ladon* Cram.—Fairly common; summer form appears after middle of June.

56-a. *Cyaniris ladon*, var. *violacea* Edw.—Our spring form, and also fairly common; appears about April 15. It and *P. rapae* are our earliest butterflies, excepting such as hibernates.

56-b. *Cyaniris ladon*, var. *neglecta* Edw.—Late summer form; found in August and September and just about as abundant as the two earlier forms.

57. *Everes comyntas* Godt.—Very common; several broods; on the wing from first of May to the first of October.

58. *Hemiargus isola* Reak.—Common, especially during past two summers; several broods, for it is found from May till October.

59. *Amblyscirtes vialis* Edw.—Fairly common; first brood appears about the first of May, second brood about the middle of July.

60. *Ancyloxypha numitor* Fab.—Very common around water; first brood, about June 1; second brood, about middle of August.

61. *Atrytone hobomok* Harr.—Common; single-brooded; flies first three weeks of June. Identification in accordance with synopsis of species of this genus in Dyar's Review of the Hesperidae of the U. S.

62. *Hylephila campestris* Bd.—Not very common; flies from August 20 till about the first week of October.

63. *Thymelicus otho*, var. *egeremet* Scud.—Fairly common; on the wing during the last half of July.

64. *Thymelicus cernes* Bd-Lec.—Our commonest skipper; on the wing from the very end of May till the middle of September almost without interruption, but most abundant in June and the last half of August, so it is likely that there are but two broods.

65. *Thymelicus alcina* Skinner—Identification somewhat uncertain; several specimens (♂) collected in July, 1909, and referred to this species; subsequently a series of *alcina* was collected in the western part of the state and when placed side by side with the Omaha specimens, differences were detected. Reference was then had to the original description of *alcina* and the western specimens were found to agree with it, leaving the identification of the Omaha specimens in doubt. The differences, however, are not great.

66. *Polites peckius* Kirby—Another very common skipper; flies with *cernes*, the seasons being about the same, and like it appears to be double-brooded.

67. *Euphyes verba* Edw.—Not found prior to 1912; one specimen taken July 3 and another July 5 of that year, in widely separated localities.

68. *Euphyes vestris* Scud.—Fairly common; appears at the very end of July and remains on the wing about three weeks; sometimes found also in early June, indicating probably two broods. Differs from var. *metacomet*, found in western part of the state, in being almost black.

69. *Lerodea osyka* Edw.—A single specimen (♂) taken by Mr. F. H. Marshall, Sept. 7, 1912, while collecting in company with the writer. Identified by means of Dyar's "Review of the Hesperiidæ of the U S." Specimen fresh and in perfect condition.

70. *Limochores pontiac* Edw.—A single specimen (♂) taken July 9, 1910. Specimen beautifully fresh, showing that this species was just beginning to emerge; unfortunately this locality—a marsh area—has not since been visited at the right season of the year for this species, and hence no further individuals have been taken or observed.

71. *Limochores dion* Edw.—While searching for *pontiac* on July 6, 1912, in the locality where the single specimen was found in 1910 (possibly a week too early), 5 specimens of *dion* (2 ♂ and 3 ♀) were taken, all of them fresh and perfect.

72. *Phycanassa delaware* Edw.—Apparently rare, as but three specimens have been taken, 2 on July 24, 1909, and 1 on July 10, 1912.

73. *Phycanassa arogos* Bd-Lec.—Found in only one locality so far—a piece of virgin prairie land—but quite abundant there. Flies during July.

74. *Epargyreus tityrus* Fab.—Extremely common; two broods, the first appearing about June 10, the second about the middle of August.

75. *Thorybes bathylus* Sm-Abb.—Common; found from May to September, no doubt double-brooded.

76. *Thorybes pylades* Scud.—Common; last half of June and early part of July.

77. *Pholisora catullus* Fab.—Very common; found from May to September; several broods.

78. *Pholisora hayhurstii* Edw.—Common; flies in company with *catullus* and its season is about the same.

79. *Thanaos persius* Scud.—Not common; specimens have been taken the latter part of April and early part of May, and also about the middle of July. All species of *Thanaos* herein listed have been identified by means of Dyar's "Review of the HesperIIDae of the U. S." in addition to colored plates.

80. *Thanaos brizo* Bd.-Lec.—Rare; occasionally found in the latter part of April and early part of May.

81. *Thanaos martialis* Scud.—Fairly common in the latter half of July, and also found (though not so common) in the first half of May.

82. *Thanaos juvenalis* Fab.—Our commonest *Thanaos*; at least two broods and possibly a third as it has been taken as early as April 3 and as late as Sept. 7 and in every month between these excepting July.

83. *Thanaos horatius* Scud.-Burg.—Rather rare; specimens have been taken in July and in Sept. & Oct.

84. *Thanaos terentius* Scud.-Burg.—Rather common; at least two broods; has been taken in April, May, July, Aug. & Sept., with April 29 as the earliest capture and Sept. 25 as the latest.

85. *Hesperia tessellata* Scudder.—One of our very common skippers; on the wing at all times from May till late in October.

The above list is without doubt incomplete and it is confidently expected that it will be materially added to in the future. During the season of 1912 seven species were added to it, they being as follows: *C. ismeria*, *P. vesta*, *T. calanus*, *S. titus*, *E. verna*, *L. osyka* and *L. dion*, and it seems likely that a dozen or more additional species may be found here.

Notes on some Beetles Reared from a Dead Elm Stick (Coleop.).

By DAYTON STONER, State University of Iowa, Iowa City, Ia.

A portion of a small, dead elm seedling which I found lying on my lawn in Iowa City on 19th October, 1912, was on 6th November, 1912, brought to the Natural Science Building of the State University of Iowa and placed in a loose-topped glass jar. This stick was about sixteen inches in length, one and one-half inches in diameter at the base and, in places, the bark had become somewhat loosened from the wood.

The temperature of the room in which the stick was kept varied considerably, fluctuating between 45 and 90 degrees Fahrenheit. In the bottom of the jar was placed a pledget of cotton which was moistened with water from time to time.

On 7th January, 1913, an adult female *Neoclytus erythrocephalus* Fab. emerged and on 10th January three more beetles of the same species. One of these, a male, attempted sexual union with a female and, after some difficulty, succeeded. The male clung to the female with his front legs and, as she walked about, often grasped one of her elytra along the sutural margin with his mandibles. He also assisted himself at times, with his mandibles by grasping the short, dorsal transverse ridges on the prothorax of the female. This characteristic was observed again in individuals that emerged at a later date.

Magdalis armicollis Say, a weevil, emerged on 16th January, 1913, from the stick of wood and on the following day another of this species emerged. In the meantime, two more *N. erythrocephalus* had emerged. Both weevils were removed from the jar as soon as discovered.

On 28th January, something over a dozen eggs of *N. erythrocephalus* were found partially hidden under a strip of bark that had been torn loose at one end. They were 1 mm. in length, roughly oblong-ovate in form, white in color and were attached to the wood by one end. A week later the eggs appeared to be developing and had assumed an iridescent appearance with a brownish spot, evidently the head of the developing larva, showing at one extremity.

All the eggs had hatched on 6th February, nine days after deposition.

On 14th February a female *Xylotrechus colonus* Fab. emerged, this making the third species secured from the stick. Up to this time the beetles that had emerged numbered thirteen.

Sometimes a number of *N. erythrocephalus* were kept alive in the jar for several days and, after the cotton in the bottom of the jar had been moistened, the beetles would come to it and chew some of the fine strands evidently for the purpose of extracting the water.

From 14th February until 15th March adults of *X. colonus* and *N. erythrocephalus* appeared at irregular intervals until, at the latter date, 15th March, the total number of beetles emerged was twenty-nine. Of these, seventeen were *Neoclytus erythrocephalus*, ten *Xylotrechus colonus* and two *Magdalis armicollis*.

The experiment, as carried out, shows, it seems to me, several points of interest:

1. The remarkably great number of beetles (twenty-nine) secured from such a small stick makes evident the extraordinary severity of the infestation.

2. The emergence of the beetles lasted over a considerable period of time, due in part, probably, to the fluctuation of temperature in the room.

3. *Neoclytus erythrocephalus* Fab. will breed under these somewhat artificial conditions.

P. S. March 24. I may add that, since sending in my manuscript, two more *Xylotrechus colonus* Fab. have emerged, thus raising the total number to thirty-one and the number of this species to twelve.

Observations on the Lepidoptera of St. Louis and Vicinity during 1912.

By the Members of the St. Louis Entom. Club.

Compiled by P. A. SCHROERS.

The collecting season started very auspiciously during the latter part of March, but did not keep its promises very long. From May 15th to June 15th the weather was cold and cloudy with chilly wintry nights; July had only a scattering of hot days, and the temperature during the first half of August and the whole of September was also below normal. Under these circumstances collecting seemed so little promising that very few members of the club carried on a systematic campaign.

The *Rhopalocera* were particularly observed by Mr. A. Knetzger, who noticed the following departures from the average occurrences; the following species appeared in far reduced

numbers: *Danais plexippus*, *Argynnis cybele*, *Phyciodes tharos* v. *marcia*, all the *Pyrrhaeis*, *Pholisora hayhursti*, *E. lycidas* and *T. martialis*. *Junonia coenia* was scarce but the first specimen appeared during the first days of August, which is unusually early; the same remark applies to *Meganostoma caesonia*. The *Papilio*s were far from plentiful, excepting *cresphontes* in one single locality a few miles north of the city.

On the other hand, *Thecla irus* and *Lycaena isola* were very common; the latter has always ranked amongst one of our scarcest insects here. *Nathalis iole* made a proverbial appearance every seven years or so, but it has been taken regularly for the last three years in fairly good numbers, always favoring the railroad tracks. *Amb. vialis*, *Eu. verna* and *Anea andrca* were also common, but of the last named the specimens observed were mostly females.

Dione vanillae, *Calpodus ethlius* did not reappear after their visit of 1911; these species cannot hibernate in this climate in any stage. The same seems to apply to *Thecla m-album*, *Terias mexicana* and others which have been seen or captured accidentally around St. Louis but never regularly enough to be included amongst our natives.

Still no sign of *Euchloe genutia* and *olympia* v. *rosa*. This is the ninth year that these pretty little insects have failed to show; they were quite common on the hills at Meramec Highlands, St. Louis County, during April. Some entomologists attribute their disappearance to the extensive forest fires which occurred in that vicinity in 1903. Others suspect the work of a parasite.

The Heterocera suffered a great deal from the low temperature of the nights and while all the usual species were present, most of them were very poorly represented. This was particularly true for the Sphingidae, *Hemaris diffinis* and *thysbe* excepted, the Saturniidae and Arctiidae with again the day fliers excepted, namely, *U. bella*, which occurred in swarms with *Scepsis fulvicollis*. The Ceratocampidae were all well in evidence, the writer caught many *E. imperialis*, *C. regalis*, *Anisota stigma* and *Dryocampa rubicunda*, *Adelo-*

cephala bicolor and *bisecta* at Creve-Coeur Lake. The genus *Schinia* yielded *trifascia*, *jaguarina*, *arcifera*, *chrysellus*, *lynx* and *nundina* a new record.

Two beautiful *Erebus odora* were observed by Mr. E. Schwarz resting on tree trunks at Meramec in August. His observations on the genus *Catocala* show that the collecting was very favorable up to the first of August, then *nil* until after the sixteenth, then normal to the end.

C. lacrymosa was particularly abundant with many beautiful variations. M. Schwarz took two specimens of v. *zelica*, one pair of v. *ulalume* and twelve v. *paulina*; v. *evelina* constituted about one-third of the whole booty of *lacrymosa*. *C. neogama*, *obscura* and *residua* were all very scarce; *C. epione*, *ultronia* and *amica* never so abundant. *C. innubens* v. *scintillans* represented about 25 per cent. of the *innubens* caught, against a proportion of 33 per cent. in 1911. *C. parta*, *consors* and *marmorata* give one specimen each.

As a new record we may mention *C. titania*, captured by Mr. McElhose some years ago and but lately identified in the collection of Mr. E. Schwarz.

Amongst other additions to the local list of nocturnals we find: *Apantesis figurata*, *Orthosia auriantiago*, *Melipotis versabilis*, *Melalopha apicalis*, *Schizura ipomoeae* and *Givira anna* (Dyar) six specimens, by the writer; *Eutrapela alciphearia*, by Mr. E. Schwarz and *Ufeus satyricus*.

Notes on some North American Noctuidae (Lepid.).

By F. H. WOLLEY DOD, Midnapore, Alta., Canada.

Hadena albiserrata Smith. (Jour. N. Y. Ent. Soc. XI, p 8, 1903)
= *H. loda* Streck.

Smith's description was made from a pair from Pullman, Washington, in the Rutger's College collection. Strecker's was a male from Seattle, and his name has preference by five years. I once thought the species was a strongly marked gray race of *versuta*, wherein I was wrong. It lacks all the bronzy tint possessed by even the grayest *versuta*. The orbicu-

lar is smaller, and ovate oblique instead of round or nearly so. In *versuta* the t. p. line is composed of a series of inward cre-nations. In *loda* they are inward dentations. This is not men-tioned in either description. It occurs on Vancouver Island, usually rather sparingly, though it was reported to be abundant at Duncans during September and early October, 1911. I have a few scattered records from elsewhere in B. C., and Mr. San-son has taken it at Banff, Alta. It is omitted from Hampson's Catalogue, but would probably find a place in *Eurotype* Hamps., as it seems to agree in structure with *contadina* Smith, and has the same general type of maculation. *Contadina* was known to Hampson only by a single specimen loaned from the Wash-ington collection.

Hadena erica Smith (Can. Ent. xxxvii, 258, July, 1905).

I cannot see that this is anything more than a rather pale form of *characta* Grote. The type of the latter is a female in the British Museum from Nevada. Hampson correctly de-scribes it as "grey-white, thickly irrorated with black, the base and medial area tinged with ochreous brown." His figure of it, the only example then in the collection, is too even, and the ochreous shades are too pronounced. *Erica* was described from a long series from Stockton, Utah, whence I have re-ceived considerable numbers. It is stated at the end of the description: "The species is allied to *characta* Grt., but differs obviously when a series is at hand." When I visited Prof Smith's collection in January, 1910, his series under *erica* con-tained six specimens, which included three species. A pair labeled "Colo. Bruce," and a female "Gunnison Colo.," were *characta*. A female from Claremont, Calif., was *susquesa* Smith, and from the type locality be it observed! A male from the Sierras, and a Colorado female were a third species which I did not recognize. The male, by the way, bore a fold-ed label "*antimoda* Smith type," a name never published. If this was the series which did duty for *characta* when *erica* was described, and on which the comparison was based, the "differs obviously when a series is at hand" must be admitted. The description of *erica* mentions an ochreous tint, but some specimens lack it almost entirely.

Hadena luteocinerea Smith.

This species, described from a single Montana male, appeared to me the same as the foregoing, nearer to typical *characta* than to the paler *erica*. Most of the black markings shown in Hampson's figure, copied from a colored drawing of the type, are erroneous.

Andropolia submissa Smith (Jour. N. Y. Ent. Soc. xix, 138, Sept., 1911) = *illepida* Grt. = *diversilineata* Grt.

Smith's description was made from five females from Provo, Utah, whence I have a long series agreeing fully with it. One of these, a male, with bipectinate antennae, I have compared with Grote's male type of *illepida* in the British Museum. Another, a female, I compared with the female type, referred by Hampson to *diversilineata* which he keeps distinct, principally as having well marked t. a. and t. p. lines. He also mentions a pale red-brown suffusion in *illepida*, not in *diversilineata* male. Smith comments at some length on these characters and Hampson's reference, in the paper above referred to, and admits that the red brown colouration is the only character that can possibly separate Grote's two names as species. Grote in his 1895 Check List eliminates the name *diversilineata* altogether as based on what Smith claimed was a patched specimen in Packard's collection, now at Cambridge, Mass. I happen to possess no Colorado specimens to which the reddish shading is attributed, but have carefully examined Grote's male type of *illepida* twice, and am satisfied as to my reference. The variation in my Utah and Arizona series is very considerable, but all the characters intergrade. The t. a. and t. p. lines are sometimes practically obsolete, though this is more frequently the case in males than in females. Some specimens have very little maculation at all, while others have it very distinct and contrasting. Such specimens have generally the whitest ground. Brown shades are evident in a few.

Polia resoluta Smith.

Described from a pair collected by Bruce in Colorado, and the male type is figured with the description. Sir George

Hampson refers *resoluta* to *illepida*, to which Smith objected. The male type is in the Washington Museum, the female in Smith's collection. I have a specimen compared with the male type, and so far as that is concerned consider Hampson's reference quite correct. The female type has a clearer, whiter ground than any I had before seen, and it seemed as if it might be distinct from the male. Hampson uses the generic term *Andropolia* Grt. for these species.

***Polia speciosa* Morr.**

I have seen the type of this, a female from Cambridge, Mass., in the Graef collection at Brooklyn. I at once noted it as a pale, brightly marked and contrasting *Hadena devastatrix*. I communicated this note to Smith in March, 1910, at which time I was in correspondence with him concerning a number of points on which we had differed. After re-examining the type himself he wrote: "The species has nothing to do with *devastatrix*. Fortunately it has one hind leg left and this shows the Agrotid structure. It is a *Peridroma*, and very close to *praefixa*." The Agrotid structure referred to of course meant tibial spines. This seemed to be equivalent to saying that *devastatrix* possessed tibial spines. I forthwith hunted through my series, and found that about fifteen per cent. of them had, varying from one to three on each hind tibia. As, therefore, the possession of hind tibial spines by *speciosa* does not disprove its being *devastatrix*, I must be guided by my original note.

***Semiophora atoma* Smith** (Trans. Am. Ent. Soc. xxxiii, 126, April, 1907).

Described from a ♂ and nine ♀ ♀ taken at treacle by Mr. J. A. Grossbeck at Lakehurst, N. J. I have one of the female co-types, which I have compared with the types in Smith's collection, and also with the *elimata* series in the British Museum. I cannot see that the description applies to anything more than small poorly marked specimens of *elimata*, of which Smith's male type has the antennae. Hampson makes *janualis* "ab. 2." of *elimata*, "like typical form, but without the black streak in the cell." There are a pair of types of *janualis* in the British

Museum, and the reference appears to be correct, though this stands as distinct in Smith's list, and in Grote's 1895 list. Grote in the description laid emphasis on the pale discolorous reniform. It is the least marked form of the species which has received a name, and to this variety *atoma* will be most correctly referred. *Badicollis* stands as "ab. 1." in Hampson, as a very grey and strongly marked form, with black well developed. This is based on an Abingdon, Mass., specimen, which my notes refer to as a type, but as it is not so listed by Hampson, I must have been in error. Type *elimata* is about intermediate between these two extremes.

***Setagrotis vocalis* Grote.**

Dr. Dyar in Proc. U. S. N. M. XXVII. 821, 1904 (Kootenai List), referred *planifrons* Smith and *congrua* Smith to this species, and correctly so. Grote's type is in the British Museum, a female from Colorado. Hampson figures a male of the same species. The figure is ochreous. *Congrua* was described from a single Oregon male. Hampson's figure of this is copied from a colored drawing of it, and is on the whole good, though a trifle exaggerated in color. The type is at Washington. *Planifrons* was described in the same paper from a single female from "Northwest British Columbia," from the Neumoegen collection, where I have seen it. Hampson's figure of this is also from a colored drawing, and has turned out pretty good, but a little too pale. I have compared Colorado specimens from my series with all three of the above types, and matched *vocalis* and *congrua* very closely indeed. I was not so successful with *planifrons*, but have two rather damaged females from Nanaimo, B. C., from the Taylor collection which are somewhat suffused and have a pronounced fuscous central shade, and one of these comes very close to the figure and is in accordance with my notes. Specimens from Kaslo, B. C., are darker blue-grey, and some of them have the central shade strongly developed.

Type *vocalis*, by the way, shows a central shade. I have pale specimens of this species from Provo and Eureka, Utah, and two from these localities are figured as *vocalis* by Messrs.

Barnes and McDunnough in their "Contributions," Vol. I. No. 4, pl. i, f. 16, and pl. v. f. 1. The species is a very variable one. The transverse lines, basal streak, black in the cell, the black or reddish-brown line on tegulae, and apparently also the transverse central shade, are variably present or absent. Smith's note in his Agrotid monograph with regard to *congrua* and *planifrons*, to the effect that, "there are so many differential characters that there is not the slightest danger of confusing them," based as it was on single specimens in a family even then well known to be very variable, was, to say the least of it, rather premature.

Invenusta Grote, type a female in the Brooklyn Museum, from Las Vegas, New Mexico (Snow), my notes say is a very even *planifrons* and has several times already been correctly referred to *vocalis*. Hampson places *vocalis* in *Lycophotia* Hubn. treating *Peridroma* Hubn. and *Setagrotis* Smith as synonyms.

Setagrotis filiis Smith (Trans. Am. Ent. Soc. xxxiii, 127, April, 1907) = *vernilis* Grote.

Filiis was described from a single male from Pullman, Washington, and said to be "allied to *vernilis* in type of maculation." I saw the type in Smith's collection. Associated with it, and correctly I thought, was a female from Laggan. I noted it as probably an exceptionally blue-gray form of *infimatis*. *Vernilis* was at that time unknown to me, and I had another species under the name in my collection. In the fall of the same year I received the form from Mr. N. B. Sanson, of Banff, Alta. In Rep. Ent. Soc. Ont., 1910, I recorded Mr. Sanson's capture as *filiis*, and suggested that it might be a form of *infimatis*. The species I recorded from Banff as *vernilis* at the same time was *congrua* or something more nearly allied to that than to *infimatis*. The following year Mr. Sanson took a nice series, and I noted the extremely close resemblance of the form to Hampson's figure of *vernilis*. I took a specimen with me to the British Museum, and found it almost exactly like Grote's type from Colorado, which is the specimen figured by Hampson. It is a very close ally of *infi-*

*mat*is, though much darker blue-gray than any of my long series of that species from the Pacific Coast, and whilst the maculation is practically identical, it is less strigate owing to the markings being much less distinct. It has no sienna-brown shades. As in *infimatis* the long narrow orbicular is sometimes confluent with the lower portion of the reniform, which also occasionally runs back on or below the median vein. A central shade is occasionally discernible in both species. I have no note as to what stood as *vernilis* in Smith's collection, but concerning that of the Washington Museum my note reads, "Hampson's figure is much bluer gray than any here." The figure represents the Banff form exactly, but is a little too brown in tone, probably the fault of the process.

Setagrotis dernarius Smith.

This was described on the page following *filiis*, from a single pair. The male was from California, without exact locality, and was sent to Smith for identification by Sir George Hampson. It is now in the British Museum as the male type. The female, from Easton, Washington, is the other type, in the Rutgers College collection. Smith mentions after the description that spines are obvious on the fore tibiae of the male, but not of the female, and that Sir George Hampson would therefore refer the species to *Lycophotia* rather than *Anomogyna*, in which he places both *infimatis* and *vernilis*, which are without fore tibial spines. I have examined that male type for these spines, but failed to find them, and believe Smith to have been mistaken. I consider both specimens to be rather unusually reddish-brown examples of *infimatis*.

Setagrotis elata Smith = **Agrotis scandens** Riley.

Elata was described from two males and a female from Colorado. A pair of types are at Washington, and a male co-type at Rutgers College. There is a pair of *scandens* at Washington lacking locality labels, marked "types," with the museum red label, which are presumably Riley's types. Smith must have completely forgotten what *scandens* looked like when he described *elata*. I have compared the types with each other and have a specimen compared with them, and never had

for one moment the least doubt of their identity, nor, I fancy, could anyone else examining them with an unprejudiced eye. It is strange that the reference has not been made before. *Elata* was known to Hampson only by a figure, on the strength of which he made it congeneric with *scandens*, referring both to *Lycophotia* Hübn. The frons is smooth, but the spines at the extremity of the fore tibiae are extremely stout, and in some specimens two or three of them are very decided long claws. Several species of *Euxoa* appear to have similar claws, not found in any *Peridroma* which I have yet examined, the latter genus being treated by Hampson as a synonym of *Lycophotia*.

***Peridroma demutabilis* Smith.**

This was described in 1893, and there are a pair of types in the Washington Museum from San Bernardino Co., Calif., and according to my notes, a male type from the same locality is in Smith's collection. Of the Washington types, the male is yellowish, but is stained. This, and two other males from Arizona associated with it, have thoracic vestiture hairy. The female type is not yellowish, and has thoracic vestiture distinctly scaly. However, they looked to me the same species. I find the vestiture very variable in some Agrotids. The antennae of the male type I should describe as serrate-fasciculate, the serrations very coarse and short. The Arizona specimens have the serrations less coarse, that is to say, less like merely well-marked joints. Every gradation can be found between a merely ciliate antenna in a noctuid, and one that is almost serrate-fasciculate, and the thickness of the joints, or length of the serrations, often varies considerably in a species. Hampson lists an Arizona male, though the key gives his figure as female, placing it in a group of *Lycophotia* with male antennae ciliate only, which by male type is incorrect.

Agrotis biclavis Grt. was described in 1879, apparently from a single Arizona male. The type I have seen in the British Museum, and it is slightly ochreous, as described by Grote, though this color is exaggerated in Hampson's figure. The antennae are finely serrate-fasciculate, or, as Grote puts it, "brush-like with the joints nodose."

I have an Arizona male which I have compared with all the above types, and the evidence seems much in favor of their all being one species, though I do not feel sufficiently sure of it to venture the direct reference at present. My own specimen has certainly the frons of *Euxoa*.

A very distinct species appears to have been mixed up with *biclavis*, probably by Grote himself. Of this there are a male and two females in the Henry Edwards collection from the Colorado Desert, and a series in the U. S. National Museum. It is a species allied to *lagena* Grt., about the same size, and with similar male antennae, that is, ciliate only.

***Hadena devastatrix* Brace.**

Hampson places this in the genus *Sidemia* Staud., the only other North American species which he makes congeneric with it being *longula* Grote. *Sidemia* finds a place in Volume vii of the Catalogue, the first of three volumes devoted to the Acronyctinae, a large subfamily characterized by the trifid neurulation, combined with spineless tibiae and smooth eyes not surrounded by bristle-like hairs. But as I have pointed out in Can. Ent. xliii, 233, July, 1911, and also in a former note in the present paper under *Polia speciosa*, *devastatrix* has not infrequently a spine or spines on the hind tibiae. Had Sir George Hampson noticed this, he would presumably have treated the species in Vol. iv.

During my recent visit to the British Museum I noted the strong superficial resemblance of *devastatrix* to the European *abjecta* Hbn., which Hampson makes a synonym of *oblonga* Haw., and refers to genus *Trachea* Ochs. in the same volume. I examined many of the specimens of *abjecta* carefully, and found that several of them had hind tibial spines. Until then I had overlooked the fact that Guenée had treated *devastatrix* as a variety of *abjecta*, and that they are considered synonymous in Staudinger's Catalogue, and given a wide distribution in the Northern hemisphere. The descriptions I have read of the larvae of the two sound a little different, and that of *abjecta* is said to confine itself closely, in Britain, to grasses growing on salt marshes and tidal estuaries. In this country,

devastatrix is of universal distribution as far south as Arizona, and is very largely a grass feeder.

Tutt, in "British Noctuae and their Varieties," Vol. I, p. 111, refers to a British variety of *abjecta* which he calls *nigro-distincta*, as "blackish-gray with distinct markings," which he says is the way Guenée described his "*abjecta* var. B." from New York and Canada, which has been referred to *devastatrix*.

***Agrotis marshallana* Westwood.**

This name stands in Smith's Catalogue as a synonym of *devastatrix*, on the authority of Walker, who appears to have referred the name to his *Mamestra contenta*. The synonymy unfortunately is copied by Sir George Hampson. The type of *contenta* is a male from Nova Scotia, and is a specimen of *devastatrix*, and so also is the Trenton Falls type of *Mamestra ordinaria* Walk., described at the same time. Both are in the British Museum. It was puzzling to find "var. *marshallana* Westwood" referred by Tutt as a form of *nigricans* Linn. Whilst in England last year I looked into the matter. I found the description and a figure in Humphrey & Westwood's "British Moths," which, however, was dated 1843 instead of 1857, as given in Smith and Hampson. (The date of the work is given by Tutt as 1841-1844.) The description is as copied by Tutt, and its author states that it was made from a single specimen from Mr. Marshall's collection, by whom it had been taken some years previously on a tree stump at Charing, in Kent. The figure certainly did not recall *devastatrix* in the least. At the British Museum, whilst looking through some British Noctuidae not installed in the general collection, I came across a female, under *nigricans*, labeled "ab. *marshallana* Westw." from the Stephens' collection, and another very similar specimen associated with it from the Mason collection. The latter specimen had the abdomen and secondaries detached but they were replaced, and both specimens were then in excellent condition. Sir George Hampson and Mr. Richard South, who were present at the time, agreed together that one of these specimens—I am not sure which—was, within every probability, the original type, and it was so labeled forthwith. Both specimens were *nigricans* or *tritici* beyond a doubt, and

these two names have been treated as one species in recent British literature.

Walker's synonymy must therefore be looked upon as one of the many quite groundless references made by him, and the synonym removed from *devastatrix*.

Mamestra tinctoria Brahm.

This name appears in Smith's 1903 Check List (No. 1996), on what authority I am wholly at a loss to discover. It is a well-known European species, common in the British Isles. It bears some resemblance to our *purpurissata*, though that has a still nearer old world ally in *advena* Schiff., of which Staudinger lists *purpurissata* as a North American variety. But whereas our species has male antennae strongly serrate-fasciculate, almost pectinate, both *tinctoria* and *advena* have them ciliate merely.

The Occurrence of the Australian Cattle Tick and the Brown Dog-tick in Key West, Florida (Acarina, Ixodoidea).

By F. C. BISHOPP, U. S. Bureau of Entomology.¹

The finding of specimens of the Australian cattle tick, *Margaropus annulatus australis* Fuller, on native cattle in Key West, Florida, by Mr. G. A. Runner, of the Bureau of Entomology, is not only of interest but also is deserving of consideration from an economic point of view. These ticks were taken on cows in the city of Key West on February 8, 1912. They were examined by the writer and found to be identical with the form of cattle ticks which occurs in the West Indies, Central America, Australia and other parts of the world, but which has not been previously taken in the United States.

In 1901 Salmon and Stiles² reported the occurrence of this tick in Porto Rico, and in 1909 the writer found it to be a severe pest of live stock in the vicinity of Tampico, Mexico.³

¹Published by permission of the Chief of the Bureau of Entomology.
²The cattle ticks (Ixodoidea) of the United States.—Seventeenth Ann Rept. Bu. of Animal Ind., U. S. Dept. Agr., for 1900, pp. 432-433, 1901.

³Hooker, W. A., Bishopp, F. C. and Wood, H. P. The life history and Bionomics of some North American ticks.—Bull. 106, Bu. of Ent., U. S. Dept. Agr., p. 118, Sept. 7, 1912.

At Victoria, Tamaulipas, Mexico, however, this form was not found, while our own variety, *annulatus* proper, was taken on cattle there. More recently (March and April, 1912) Mr. G. N. Wolcott took the Australian cattle tick, as this form is commonly called, in numbers on horses and cattle, and a single female (one-third engorged) on an Angora goat in the Province of Pinar del Rio, Cuba. This variety has also been reported from practically all of the other islands of the West Indies.

With the close trade relations maintained between Cuba and other West Indian Islands and Key West, it is not difficult to account for the introduction of the tick in that port. There is always danger of this form being brought into southern Texas from Mexico, but the likelihood is equally great of its establishment on the mainland of Florida, from the infestation now existing in Key West. This is made more easily accomplished now that Key West is placed in more intimate connection with the mainland by the East Coast Railway.

The importance of the establishment of *M. annulatus australis* in the United States is problematical. There is reason to believe that it would successfully breed in most of our Southern States. Certain habits of this form make its presence in the United States a grave danger. It is known in other countries to have much more generalized host relationships than has the variety common to this country. For instance, Rohr⁴ says that in Brazil although cattle are the principal hosts, the horse, goat, sheep, dog, rabbit and man are attacked also. Adults of both sexes were found on dogs in Jamaica by Newstead.⁵ He also says that the larvae are a great pest of man there and that it is the common belief that this stage will attack any vertebrate animal.

It is possible, of course, that this form if introduced into the United States may soon take on the characters and habits

⁴Estudos sobre Ixodidas do Brasil—(Trabalho do Instituto do Oswaldo Cruz), Rio de Janeiro, p. 90, 1909.

⁵Ticks and other blood sucking Arthropoda. Reports of the twenty-first expedition of the Liverpool School of Tropical Medicine, Jamaica, 1908-1909.—Ann. of Trop. Med. and Parasitology, Vol. III, No. 4, p. 436, Nov. 1909.

of *annulatus* proper and prove to yield to the same eradication measures as are being employed against that tick. A change in form of the females of the Australian cattle tick when bred for several generations in the United States has been reported by Salmon and Stiles.⁶ The male characters, however, did not appear to be modified. Tests were not made to determine if modifications in the host habits occurred. Should this habit of feeding on a large number of hosts persist, the methods of eradicating the North American cattle tick would be much less effective against this form if it becomes established in this country. There is little doubt that eradication of *M. annulatus australis* could be accomplished comparatively easily now that it is probably confined to Key West, and this question should be given serious consideration.

The brown dog-tick, *Rhipicephalus sanguineus* Latr., has been found commonly in extreme southern Texas, but until recent collections were made in Key West, Florida, by Mr. G. A. Runner, the species was not known to occur in other parts of the United States. On February 8, 1912, Mr. Runner took a nymph and several males and females on a dog in Key West and on the same date and in the same city he found five females (one-third engorged) on a donkey. This species is widely distributed in tropical and subtropical countries, and has been recorded from a large number of hosts. In the United States it was previously taken on the dog only. In February and March, 1912, Mr. G. N. Wolcott found this tick commonly on dogs in Santiago de las Vegas and Pinar del Rio, Cuba. Specimens previously collected in Cuba were referred by Prof. Neumann to *R. bursa*. It is probable that the infestation at Key West was introduced from Cuba or some of the other West Indian Islands, in all of which the species occurs.

This tick is often an important pest of dogs but seldom becomes injurious to other animals. It would probably breed in all of the Gulf States, but is not likely to become a serious pest here.

⁶The cattle ticks (Ixodoidea) of the United States—Seventeenth Ann. Rept., Bur. of Animal Ind., U. S. Dept. Agr. for 1900, pp. 432-433, 1901.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., OCTOBER, 1913.

A Utilitarian Value of Entomology.

In the advertising pages of one of the oldest and largest popular American monthly magazines, during the past summer, there appeared a full column advertisement headed "Bitter Root Valley offers you Health, Freedom and Fortune!" It went on to describe the handsome profit to be obtained from investing in apple and cherry orchards offered for sale by the exploiting company and laid emphasis on the "health, independence and ideal environment in which to live and be happy" which, with this "generous competence," "make up the sum total."

The location of Bitter Root Valley is nowhere stated in this advertisement. That, perhaps, is one of the items of this opportunity which the reader of the advertisement is urged to investigate.

The entomologist, reading this alluring proposition, will perhaps think of Bitter Root Valley in western Montana where, according to publications of the U. S. Department of Agriculture, Rocky Mountain spotted fever "appears in its most virulent form;"* where "the death rate [therefrom] is about 70 per cent;"+ where "it was estimated in 1904 that 200 cases

*Circular No. 136, Bur. of Ent., U. S. Dept. Agr., p. 1, March 31, 1911.

†Bull. 105 of the same, p. 12, Nov. 17, 1911.

of the severe type of the disease had occurred up to that year . . . [which] means a loss of about 140 lives in this small valley. At the present time, with an increase in the population of the valley, it is estimated that about 20 cases of the disease occur annually. This means a loss of about 15 lives each year and this loss is certain to increase as the population of the valley becomes larger."[†]

It may be that the health-offering Bitter Root Valley is not in Montana and we have no wish to hinder the agricultural development of any valley whatsoever. We do suggest, however, that some knowledge of entomology and of the relations of ticks and insects to disease is of practical and utilitarian value and should be employed by the "investigator" of preferred investments.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Changes of Address.

The address of Mr. C. A. Frost is now 26 Pond St., South Framingham, Mass., instead of 40 Grant St.

The address of Prof. J. M. Aldrich is now Experiment Station Building, Lafayette, Indiana, instead of Moscow, Idaho.

The address of Mr. Francis X. Williams is now Bussey Institution, Forest Hills Station, Jamaica Plain, Massachusetts, instead of Museum Building, Lawrence, Kansas.

Lepidopterous Eggs From the Stomach of a Wren.

August 18, 1912, I found near Nelson, North Queensland, a male of the little wren *Cisticola exilis* lying dead upon the ground; its stomach contained, besides adult and larval insects of several orders, about three dozen green lepidopterous eggs, probably those of a moth. They appeared to be uninjured and I carefully kept them; on August 20 an examination of them was made and some were marked with small pink dots which seemed to indicate development. However, by more careful examination it appeared that these dots were really the embryos of parasites of the genus *Trichogramma* (only an antenna was clearly made out which resembled that organ in the genus named). Development did not advance farther.—A. A. GIRAULT, Nelson, North Queensland.

[†]Ibid., p. 14.

The Zimmermann Collection of Coleoptera.

The statement in the Canadian Entomologist, Vol. XXI, p. 53, 1889, that the Zimmermann Collection of Coleoptera is in Harvard College, probably refers to the American species only, as the exotics are in the collection of The Academy of Natural Sciences of Philadelphia. Mr. Zimmermann's Diary and four manuscript catalogues, in which the specimens are numbered in an interrupted series from 1 to 17351, are also in the possession of the Academy. The numbers omitted may be in the books referred to by Dr. Hagen in his account of this man's life and collection. Mr. Zimmermann's scheme was to give each species, which he received, a number, which was placed on the pin of one specimen, together with a piece of colored paper, using a different colored paper for each additional lot received, whether from the same locality or not. The data in the catalogues consist of the name of the species, from whom received, and when obtained, in Roman letters, and the exact locality, with an occasional remark, in German script. This method saved much time in labeling and was very good until the specimens accidentally strayed from the numbered individual or the catalogues were misplaced.

Many of the specimens are from Schaum, Sturm, Burmeister, Melly, and Perkins, but very few of the American species have been found in the Academy's cabinet.—E. G. VANATTA.

Mantid Eggs Apparently Eaten by Birds (Orth.).

During a trip up Pyramid Mountain opposite Nelson, North Queensland, August 17th, 1912, I found nearly a half dozen large eggmasses of a mantid, of the form usual to the common North American species, attached to twigs of young trees and which appeared to have been partly excavated by a bird of some kind; the excavation sometimes was directly into the side, at others longitudinally or axially. The holes were round in outline, subconical and about $\frac{3}{8}$ -inch diameter or somewhat less. Later, on August 24, I found one of these masses torn into strips and incorporated into the substance of the nest material of an Australian Robin. Also on August 29, 1912, Mr. Alan P. Dodd called my attention to the nest of a honeyeater which was lined interiorly with the golden yellow-green frothy material surrounding the eggmasses. Thus, it is most probable that birds use this material and other parts of the eggcase for building material, instead of for food.—A. A. GIRAULT, Nelson (Cairns), North Queensland.

Hymenoptera Chalcidoidea Eaten by Birds.

From the stomachs of several birds shot in the forests about Nelson, North Queensland, to wit, the wren *Cisticolor exilis* (pteromalids) and the honeyeater? *Pseudogerygone* species (chalcidids) and several others, a few chalcidoids were taken and an occasional wasp—A. A. GIRAULT, Nelson, North Queensland.

Ants Crossing Water (Hymen.).

In a letter to "Nature" (June 26, 1913, p. 425), Mr. John C. Willis of Rio de Janeiro, mentions that a fly trap being found covered with ants, it was put on a finger bowl which was placed in a plate of water. The ants in coming to the edge of the water, ran around the bowl until seemingly convinced there was no way across, and then calmly "took to the water" and ran across it by the aid of surface tension, without "getting their feet wet." They soon returned, crossing in the same way, and this went on regularly, a steady procession crossing the water.

A Dragonfly Depositing Eggs in a Rainpool Over Concrete (Odonata).

On April 16, 1913, I observed a dragonfly hovering about a very shallow pool of water on a concrete pathway, occasionally darting rapidly down to it and dipping the end of the abdomen into the pool in the characteristic manner of oviposition. The species was unknown to me; no eggs could be found but the pool was full of debris which would make it difficult to find them. The sun was shining brightly (8.30 A. M.) and the pool had completely dried after several hours.—A. A. GIRAULT, Nelson, North Queensland.

Some Colorado Dragonfly records (Odonata).

Recently Mr. W. J. Gerhard sent me some dragonflies collected by him near Denver, Colorado, about the middle of July, 1909.

Mr. Gerhard's brief field notes, on the dates of interest in this connection, are as follows:

July 13, 1909. At Berkeley Hills, a suburb of Denver. The edge of a small lake or pond yielded nothing of interest save dragonflies.

July 14, 1909. Berkeley Hills.

July 15, 1909. Berkeley Hills and Clear Creek (the latter about $\frac{3}{4}$ of a mile from Berkeley Hills).

July 16, 1909. Berkeley Hills and Clear Creek.

July 17, 1909. Clear Creek.

Hetaerina americana, 5 males, 2 females; July 17, 1909.

Argia vivida, 1 female; July 17, 1909.

Amphiagrion saucium, 5 males, 2 females; July 15, 17, 1909.

Enallagma clausum, 1 male; July 16, 1909.

Enallagma calverti, 1 male; July 13, 1909.

Enallagma carunculatum, 1 male; July 13, 1909.

Enallagma civile, 1 male; July 13, 1909.

Ischnura damula, 5 males, 4 females; July 13, 1909.

Ophiogomphus severus, 1 male, 1 female; July 14, 17, 1909.

Sympetrum semicinctum, 4 males, 3 females; July 13, 14, 16, 17, 1909.

Sympetrum corruptum, 2 females; July 13, 14, 1909.

Libellula pulchella, 1 female; July 16, 1909.

E. B. WILLIAMSON, Bluffton, Indiana.

The True Male of *Nehalennia integricollis* and *N. pallidula*, n. sp. (Odon.).

In describing *Nehalennia integricollis* in the NEWS for July last, page 312, from a female type, a male from Haulover, Florida, was doubtfully referred to this species and the differences, other than sexual, between it and the type were pointed out, page 314. On June 27 and July 2, at Malaga, New Jersey, I obtained three pairs of *integricollis* and a number of other individuals of both sexes. The males so obtained are the true *integricollis*, are much like the females in color, and consequently quite different from the Haulover male. To the Haulover male a *new name* must therefore be assigned, and *PALLIDULA*, in allusion to the narrower metallic green area of the thoracic dorsum is suggested; figures 7 and 11, page 313, illustrate the appendages of *pallidula* male.

Some additional notes on *integricollis* follow. The words "Superior appendages ♂ longer than inferiors," must be stricken out of the character of group I, page 311, as in true *integricollis* ♂ the superior appendages are not longer than the inferiors, although this is the case in *atrinuchalis*, *speciosa*, *selysii* and *pallidula*.

In the recently killed *integricollis* ♀ the eyes are olive green above becoming bluish-green on the middle third and yellowish-green below. Genae below the level of the base of the antennae very pale blue and a slender finger-like prolongation of this color runs upward each side into the dark metallic green of the rear of the head. The anterior surface of the frons, the rhinarium, the bases of the mandibles and the labrum are pale bluish, the last with a transverse basal black stripe. The pale transverse occipital line not enlarged at its extremities. The sides of the thorax and of abdominal segments 1-7 or 8 greenish-yellow, or in the tenerals pinkish.

In the recently killed ♂ *integricollis* the eyes are blue-black above and become increasingly paler blue to the under surface. The remainder of the head is colored as in the ♀ described above. The metallic green of the dorsum of body generally (including the head), is darker than in the ♀ owing, partly at least, to the admixture of more purple. Thoracic dorsum metallic green reaching laterad beyond the humeral suture as in the ♀. Sides of the thorax and of abdominal segments 1-6 pale bluish, of 7 and 8 yellowish, or of 8 bluish. Dorsum of abd. seg. 8 dark metallic green with no pale dorsal spots; 9 and 10 blue, 9 with a metallic green stripe on each side of dorsum reaching from base (where they are narrowly confluent with each other) one-half to two-thirds way to the hind end, 10 with a transverse basal black line.

Hind dorsal margin of 10 cleft in the middle and spinulose. Appen-



dages as shown in the accompanying figures, resembling those of *irene* and *gracilis* (cf. page 313). The male is like the ♀ also in having *two* antenodal cells. Abd. 18.5-19.5, hind wing 11.5-12.5 mm.

In the teneral ♂ the pale colors of the body including the eyes are pale violaceous.

The type of this description of *integricollis* ♂ is now in the collection of the Academy of Natural Sciences of Philadelphia.

N. integricollis was taken at Malaga, on the dates mentioned, at the southwest corner of the pond made by damming Scotland Run, a branch of the Maurice River. It was flying among the abundant pickerel weeds (*Pontederia cordata*, var. *angustifolia*) and white water lilies (*Castalia*) then in bloom and was associated with *Telagrimon daeckii* and numerous *Ischnura posita*, while *Pachydiplax longipennis* and *Libellula incesta* flew above.

PHILIP P. CALVERT.

The Druce Collection of Lepidoptera.

The magnificent collection of butterflies and moths, with its hundreds of types, formed by the late Herbert Druce, Esq., has passed into the Joicey collection, at "The Hill," Witley, Surrey, with the exception of the Lycaenidae and Hesperidae, which are retained by Hamilton H. Druce, Esq.

Entomologists are cordially invited to use the collection for naming and comparing.

A. NOAKES, for J. J. JOICEY, Esq., The Hill, Witley, Surrey, England.

Material Wanted—Lepidoptera.

I am preparing a Revision of the Heodina (Chrysophanids or coppers) and there are several American species I do not possess, viz: *Tharsalea arota*, *Heodes fieldeni*, *Chalceria cupreus*, *snocwi* and *rubidus*, *Satyrium fuliginosa*. I only possess very few specimens of *Gacides*, *xanthoides*, *editha* and *gorgon*.

I should be very grateful if any Lepidopterists would be so good as to send me these species for which I would make return in Exotics or Palearctic species, or I would pay cash.—G. T. BETHUNE-BAKER, 19 Clarendon Road, Edgbaston, England.

The Audubon Entomological Club.

On May 27, 1913, the Audubon Entomological Club was organized at the office of the Bureau of Entomology at Audubon Park, New Orleans, La., by E. R. Barber, Dr. Wm. E. Cross, J. R. Horton, W. V. King and T. E. Holloway. The Club will afford its members an opportunity for social reunion, but the principal object will be for the discussion of entomological work. It is planned to have neither officers nor a constitution, as these are regarded as unnecessary for the purposes of the organization, which is altogether informal and not

representative of any special group of workers, though most of the members are connected with the Bureau of Entomology. On June 3, the members met at a well known restaurant in New Orleans for dinner, and on this occasion the name of the Club was chosen and a general plan of work was outlined. The meetings will be held hereafter at intervals of two weeks, and at each meeting the discussion will be led by one of the members, who will talk on a given subject.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues of the News, which are generally dated the year previous.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

- 1—Proceedings, Academy of Natural Sciences of Philadelphia.
4—The Canadian Entomologist. 7—U. S. Department of Agriculture, Bureau of Entomology, Washington. 9—The Entomologist, London. 11—Annals and Magazine of Natural History, London. 12—Comptes Rendus, l'Academie des Sciences, Paris. 21—The Entomologist's Record, London. 22—Zoologischer Anzeiger, Leipzig. 25—Bolletino, Musei di Zoologia ed Anatomia Comparata d. R. Universita di Torino. 35—Annales, Societe Entomologique de Belgique. 38—Wiener Entomologische Zeitung. 40—Societas Entomologica, Zurich. 42—Journal, Linnean Society, Zoology, London. 43—La Cellule. 46—Tijdschrift voor Entomologie. 50—Proceedings of the U. S. National Museum. 51—Novitates Zoologicae, Tring, England. 56—Mittheilungen, Schweizerischen entomologischen Gesellschaft, Schaffhausen. 59—Sitzungsberichte, Gesellschaft der naturforschenden Freunde, Berlin. 73—Archives, Zoologie Experimentale et Generale, Paris. 74—Naturwissenschaftliche Wochenschrift, Berlin. 78—Gardeners' Chronicle, London. 79—La Nature, Paris. 86—Annales, Societe Entomologique de France, Paris. 87—Bulletin, Societe Entomolo-

gique de France, Paris. 92—Zeitschrift für wissenschaftliche Insektenbiologie. 102—Proceedings of the Entomological Society of Washington. 113—Archives Italiennes de Biologie. 119—Archiv für Naturgeschichte, Berlin. 153—Bulletin, American Museum of Natural History, New York. 161—Proceedings, Biological Society of Washington. 166—Internationale Entomologische Zeitschrift, Guben. 172—The American Museum Journal, New York. 173—Die Grossschmetterlinge der Erde, Fauna Americana, von A. Seitz, Stuttgart. 179—Journal of Economic Entomology. 180—Annals, Entomological Society of America. 189—Journal of Entomology and Zoology, Claremont, Calif. 198—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. 216—Entomologische Zeitschrift, Frankfurt a. M. 223—Broteria, Revista de Ciencias Naturales del Collegio de S. Fiel. (Ser. Zoológica). 228—Georgia State Board of Entomology, Atlanta. 231—Annuaire, Musée Zoologique de l'Académie Impériale des Sciences de St. Petersburg. 239—Annales, Biologie Lacustre, Brussels. 243—Yearbook, Department of Agriculture, Washington, D. C. 251—Annales, Sciences Naturelles, Zoologie, Paris. 264—Boletín del Ministerio de Agricultura, Buenos Aires. 269—Memoirs, Department of Agriculture in India. Entomological Series, Calcutta. 273—Proceedings, Royal Physical Society . . . , Edinburgh. 275—Philippine Journal of Science, Manila. 298—Öfversigt, Finska Vetenskaps-Societätens Förhandlingar, Helsingfors. 313—Bulletin of Entomological Research, London. 349—Zoologische Annalen. Zeitschrift für Geschichte der Zoologie, Würzburg. 350—Bulletin from the Laboratory of Natural History of the State University of Iowa, Iowa City. 369—Entomologische Mitteilungen, Berlin-Dahlem. 394—Parasitology, Cambridge, England. 411—Bulletin of the Brooklyn Entomological Society. 420—Insecutor Inscitiae Menstruus: A monthly journal of entomology, Washington, D. C. 422—Coleopterologische Rundschau, Wien. 432—The Civic Federation of New Haven, Conn.

GENERAL SUBJECT. Aichberger, R. v.—Das Gehirn eines niederen Insektes, 74, xii, 347-49. Bishopp, F. C.—Some important insect enemies of live stock in the U. S., 243, 1912, 383-396. Brehme, H. H.—Butterflies and other insects noted at Barnegat Pier, 411, viii, 75-6. Brocher, F.—Recherches sur la respiration des insectes aquatiques, 239, v, 218-258. Chase, W. W.—Principal insects and diseases of the apple in Georgia, 228, Bul. 38, 58 pp. Chittenden, F. H.—Insects injurious to the onion crop, 243, 1912, 319-334. Coupin, H.—Les pleurs de sang singulier moyen de défense des insectes, 79, xli, 402-03. Crampton, C. B.—Ecology, the

best method of studying the distribution of species in Great Britain, **273**, xix, 33-36. **Dow, R. P.**—The rector of Barham and his times, **411**, viii, 68-74. **Franck, G.**—A wandering collector's narrative, **411**, viii, 62-67. **Goldi, E. A.**—Die bisherige anschauung bezüglich der homologie der insekten-mundteile mit den derivaten des spaltfusses...., **56**, xii, 146-151. **Haskin, J. R.**—Attacks on insects and allied questions, **21**, 1913, 167. **Hewitt, C. G.**—The imperial bureau of entomology, **4**, 1913, 171-74. **Hooker, C. W.**—Obituary, **179**, vi, 334-36. **Jacobi, A.**—Mimikry und verwandte erscheinungen. Fr. Vierweg & Sohn in Braunschweig. 1913, 215 pp. (Bd. 47 of "Die Wissenschaft.") **Jehn, H.**—Die preparation gruner raupen, **216**, xxvii, 58-9. **Keller, O.**—Die Antike Tierwelt. 2d Bd. Leipzig, 1913. Verlag von W. Engelmann. (Insecta & Arachnida, 395-484). **King, H. H.**—Note on an entomological store-box suitable for use in the tropics, **313**, iv, 85. **McAtee, W. L.**—Relation of birds to grain aphides, **243**, 1912, 397-404. **Maxwell-Lefroy & Finlow.**—Inquiry into the insecticidal action of some mineral and other compounds on caterpillars, **269**, iv, 269-327. **Quaintance, A. L.**—Remarks on some of the injurious insects of other countries, **102**, xv, 54-83. **Timberlake, P. H.**—Preliminary report on the parasites of "Coccus hesperidum" in California, **179**, vi, 293-303. **Townsend, C. H. T.**—A new application of taxonomic principles, **180**, vi, 226-232. **Weiss, H. B.**—Apperceptional expectancy as a factor in protective coloration, **4**, 1913, 193-4. **Wesenberg-Lund, C.**—Fortpflanzungsverhältnisse: Paarung und eiablage der susswasserinsekten. (Fortschritte der Naturwissenschaftlichen Forschung, viii, 161-286, 1913). **Ziegler, H. E.**—Ueber die neue nomenklatur, **349**, v, 255-265.

Valette, L. H.—Apuntes descriptivos sobre algunos invertebrados encontrados en un viaje a las Islas Orcadas, **264**, xv, 293-306.

ARACHNIDA, ETC. **Clementi, A.**—Sur les mecanismes nerveux qui reglent la coordination des mouvements locomoteurs chez les Diplopodes, **113**, lix, 1-14. **Hilton, W. A.**—Nerve cells of tarantula, **189**, v, 93-95. **McGregor, E. A.**—The red spider (*Tetranychus bimaculatus*) on cotton, **7**, Circ. 172. **Nuttall, G. H. F.**—Note on coloration in ticks. Observations on the biology of Ixodidae, **394**, vi, 49-51, 68-118. **Robinson & Davidson.**—The anatomy of "Argas persicus," **394**, vi, 20-46.

Carl, J.—Diplopodenstudien I, **22**, xlii, 174-77. **Ewing, H. E.**—New acarina, **153**, xxxii, 93-121. **Verhoeff, K. W.**—Zwei neue gattungen der Trachyzona u. superfam. der AscospERMOPHORA, **22**, xlii, 125-143.

APTERA AND NEUROPTERA. Bugnion, E.—Le bruissement des termites, **56**, xii, 125-139. La differentiation des castes chez les Termites, **87**, 1913, 213-218. **Campion, H.**—Another abnormal dragonfly wing, **9**, 188-89. The antenodal reticulation of the wings of Agrionine dragonflies, **1**, 1913, 220-224. **Ris, F.**—Nochmals die Perlide "*Capnionura nemuroides*" und einige bemerkungen zur morphologie der perliden, **369**, 1913, 178-185. **Smith, L. W.**—The biology of *Perla immarginata*, **180**, vi, 203-212.

Bacon, G.—A species of Collembola found with termites, **189**, v, 113. **Bartenef, A. N.**—Contributions to the knowledge of the sp. of the gen. "*Sympycna*" and their subdivisions (English), **231**, 1912, 144-164. **Cockerell, T. D. A.**—Two fossil insects from Florissant, Colorado, with a description of the venation of the Aeshnine dragonflies, **50**, xlv, 577-583. **Hood, J. D.**—Nine new Thysanoptera from the U. S., **181**, xxvi, 161-66. Two new Thysanoptera from Porto Rico, **420**, i, 65-70. **Longinos Navas, R. P.**—Crisopidos sudamericanos, **223**, xi, 73-104 (cont.). **Martynov, A. B.**—On two collections of Trichoptera from Peru (English), **231**, 1912, 1-40. **Valette, L. H.**—(See Arachnida). **Walker, E. M.**—New nymphs of Canadian Odonata, **4**, 1913, 161-170.

ORTHOPTERA. Meijere, J. C. H. de—Ueber das ausschluflen der Mantiden, **46**, xvi, 62-68. **Ramme, W.**—Ueber einen zwitter von "*Thamnotrizon fallax*," **59**, 1913, 83-89. **Regen, J.**—Untersuchungen ueber die stridulation von "*Gryllus campestris*"...., **22**, xlii, 143-44. **Washburn, F. L.**—A successful trap for cockroaches, **179**, vi, 327-29.

Azam, T.—Notes orthopterologiques, **87**, 1913, 218-222. **Borelli, A.**—Nuovo genere di Dermatteri della Republica Argentina. Di alcuni Dermatteri d. R. A., **25**, xxvii, No. 649, 660. **Caudell, A. N.**—A new pseudophylliid from Jamaica, **420**, i, 57-8. **Chopard, L.**—Contribution a la faune des O. de la Guyane Francaise (2d Mem. Gryllidae), **86**, lxxxi, 401-432. **Griffini, A.**—Intorno ad alcuni Stenopelmatidi del Museum d'Historie Naturelle di Parigi, **25**, xxvii, No. 662. **Shelford, R.**—Some new sp. of Blattidae in the Zoological Museum, Imperial Academy of Sciences, St. Petersburg, **231**, 1912, 56-60.

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DISTRIBUTION AND SPECIES-FORMING OF ECTO-PARASITES, By VERNON LYMAN KELLOGG. *American Naturalist* for March, 1913, Vol. XLVII, No. 555, pp. 129-158.

This paper, the last of several by the author in regard to the distribution and species-forming among the Mallophaga, is a most interesting and important one from several standpoints.

The author has divided the paper into five parts. The first is introductory. The second deals with the habits, zoological position, and life history of the Mallophaga. In the third the writer treats of the distribution of the ecto-parasites and their systematic relationships, together with some related problems. It is in the fourth, the longest and most important part of the paper, that the writer enters into the consideration of the very interesting phylogenetic problems suggested by the study of the host and geographic distribution. Part five is a short summary of conclusions. The author pays special attention to two aspects of the distribution of the biting lice. In regard to the first he states, "there is apparent in Mallophagan distribution a general faithfulness of parasite to host-kind or group of related host-kinds, and this without much reference to geographical conditions." In regard to the second aspect the writer has already written much. Here he presents in a fuller and more convincing form his law in regard to the distribution of certain parasites. He explains it as follows, "there appears a plain tendency for a single parasite species to be common to two or more related host species, even though these hosts be so widely separated geographically and so restricted to their separate geographic ranges that all possible chance of contact between individuals of the different host species seems positively precluded." This state of affairs the writer explains as follows, "the parasite species has been handed down practically unchanged to the present specifically and even generically distinct several bird species from their common ancestor of earlier days."

In regard to the general significance of this law, I can state that I have found it to hold true in regard to the distribution of certain ectoparasitic mites, but not for all of them or for many groups. However, the parasitic Acarina constitute several distinct phylogenetic units, and their habits are very diverse. It would be of great importance to science if some one would investigate other groups of ecto-parasites in order to see if Professor Kellogg's law has a general application.—H. E. EWING.

BIBLIOGRAPHIA LEPIDOPTEROLOGICA. W. Junk, Verlag und Antiquariat für Entomologie. Berlin W. 15. Sächsische Str. 68. 1913. In linen boards, 1 mark 40 pfennig, post free.—In the *News* for April, 1912, p. 191, we summarized the contents of Herr Junk's very useful *Bibliographia Coleopterologica*. The present catalog and price list is a similar production, including 3952 titles, preceded by a 20 page classified resumé of the most important literature on the Lepidoptera and a 6 page list of living Lepidopterological authors with their addresses. The

extent of the literature on this group of insects is such that Herr Junk estimates the cost of a working library of the most important books and periodicals at 50,000 marks, while the yearly subscriptions to important journals would amount to about 600 marks. (*Advertisement.*)

OBITUARY.

DR. HORACE JAYNE.

(Portrait, Plate XII)

Dr. Horace Jayne, at one time actively interested in the study of the Coleoptera, died at Wallingford, Pennsylvania, near Philadelphia, on Tuesday, July 8, 1913, in his fifty-fifth year.

He was a son of Dr. David Jayne and was born in Philadelphia, March 17, 1859, graduated from the College of the University of Pennsylvania in 1879 and from the Medical School of the same in 1882. After studies at the universities of Leipzig, Jena and Johns Hopkins, he returned to that of Pennsylvania, where he became assistant instructor in Biology and professor of Vertebrate Morphology, 1884-1894. He took an active part in the founding of the School of Biology, serving as secretary of the Faculty thereof, 1884-1889, Dr. Joseph Leidy being director of the school. In 1889 Dr. Jayne became Dean of the College Faculty, and in 1892 of that of the Department of Philosophy also, holding both positions until 1894. From that year until 1905 he was professor of Zoology and director of the Wistar Institute of Anatomy and Biology of the same university. In later years, until 1909, he took an active editorial interest in the *Journal of Morphology*, the *Anatomical Record* and the *Journal of Experimental Zoology*.

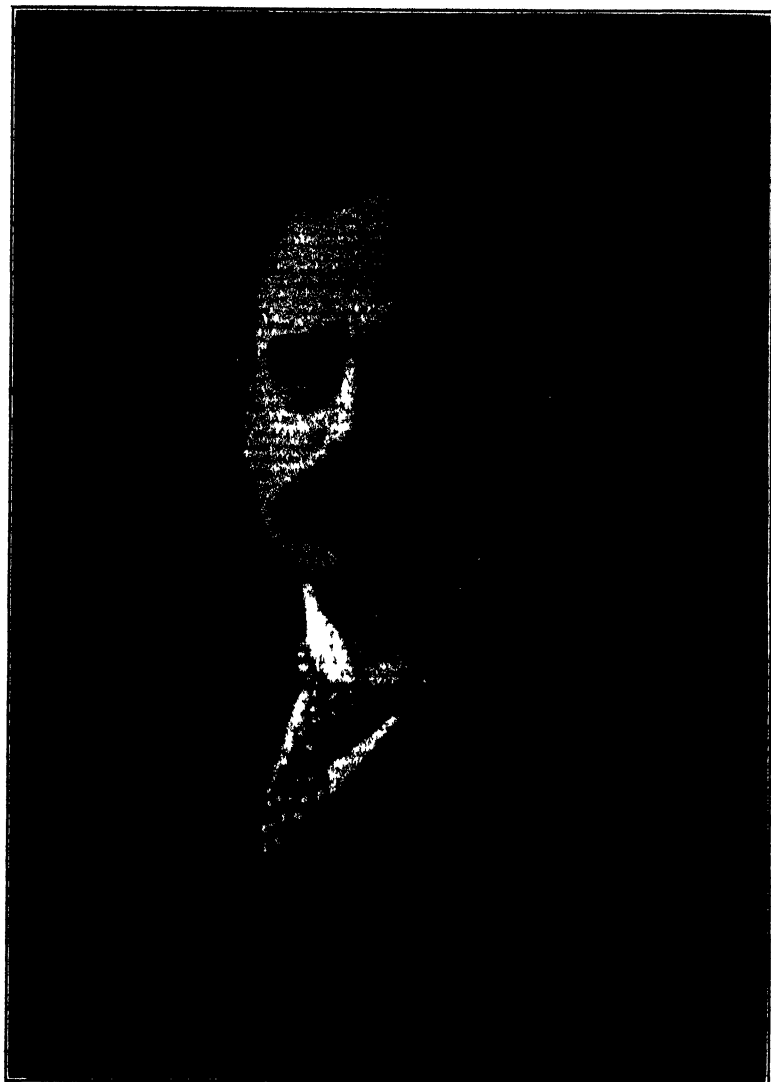
His zoological activities for the last thirty years of his life were mainly concerned with the mammals, and his chief work was *Mammalian Anatomy, A Preparation for Human and Comparative Anatomy. Part I. The Skeleton of the Cat, its Muscular Attachments, Growth and Variations, compared with the Skeleton of Man* (Philadelphia, J. B. Lippincott Co., 1898), a stout octavo volume of 836 pages and over 500 original illustrations. This volume was intended, to quote from the preface, as "the first of a series which aims to present a more

accurate and more comprehensive description of the structure of a typical mammal than has been hitherto attempted." No other volume appeared, however.

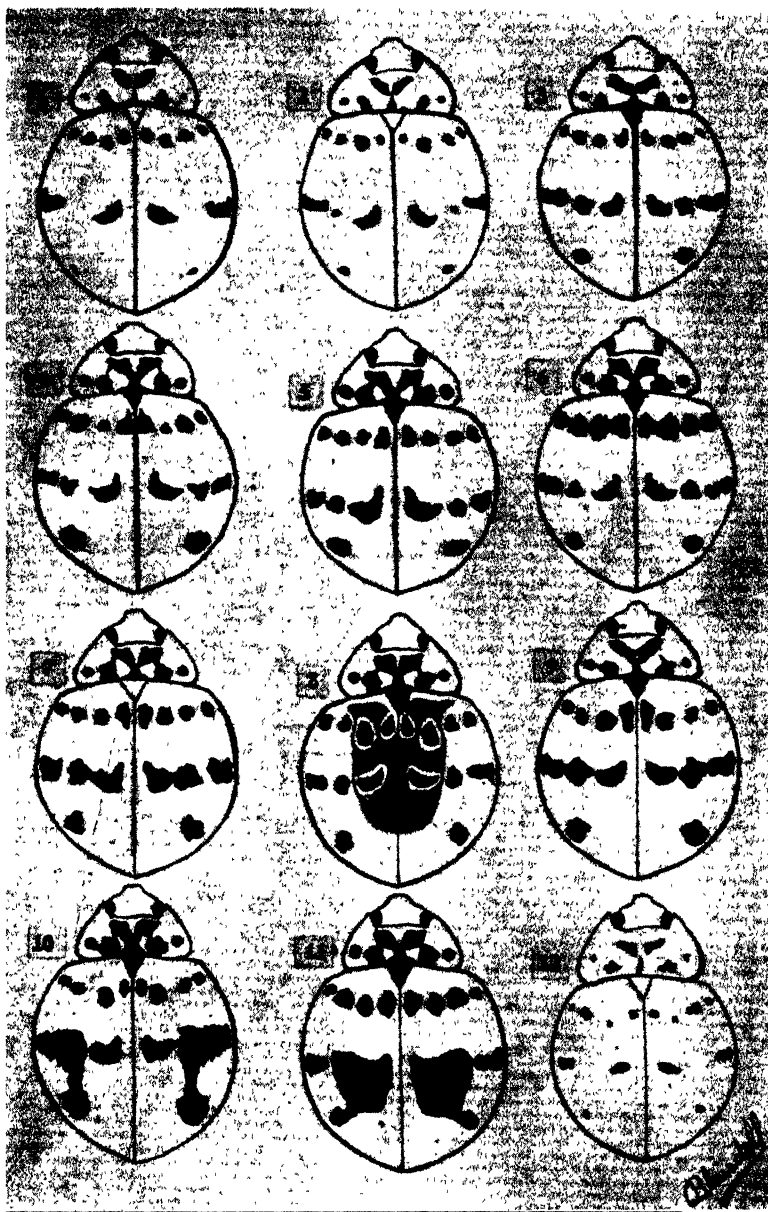
In a brief notice which he read on April 10, 1895, at a memorial meeting for his university colleague, John A. Ryder, Dr. Jayne refers to his own work, "in arranging part of the collections of the [American] Entomological Society" at a time when he first made Ryder's acquaintance. This must have been about 1876. He became a member of the Society August 9, 1875, in the year before that body came to occupy quarters in the building of the Academy of Natural Sciences. His association here with Drs. LeConte and Horn is indicated in the opening paragraphs of his two Coleopterological articles, *Descriptions of some monstrosities observed in North American Coleoptera* (Trans. Amer. Ent. Soc. VIII, pp. 155-162, pl. IV, June, 1880) and *Revision of the Dermestidae of the United States* (Proc. Amer. Philos. Soc. XX, pp. 343-377, pls. 1-4, August 18, 1882). The latter paper is the more pretentious, and in it the author says: "The arrangement of genera is, substantially, that already well known, save only the necessary alterations incident to the introduction of two new genera, [*Acolpus* and *Axinocerus*]. The specific classification is almost entirely original." Three new species of *Attagenus*, one of *Acolpus*, two of *Trogoderma*, one of *Axinocerus*, were described. In both of these papers the author's name appears as Horace F. Jayne, but he dropped the "F." in later years.

Dr. Jayne, in virtue of his position as secretary of the Faculty of Biology of the University of Pennsylvania, in 1888, will ever be associated in my memory with the happy beginnings of my own collegiate studies in zoology and with his willing assumption of the task of major examiner for the doctor's degree, a post made suddenly vacant by the death of Ryder. Those kindly recollections have remained unclouded, and it is with genuine sorrow that this brief notice is written in some slight acknowledgment of him who has passed away.

P. P. C.



DR. HORACE JAYNE.



OLLA ABDOMINALIS—BLAISDELL.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXIV.

NOVEMBER, 1913.

No. 9.

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Variations in the Maculation of *Olla abdominalis* Say (Coleop., Coccinellidae).

By FRANK E. BLAISDELL, SR., San Francisco, Cal.

(Plate XIII.)

The present paper is based on a study of the variations in the maculation found to be present in a series of 200 specimens of *Olla abdominalis*, collected on November 26, 1910, at Vine Hill, Contra Costa County, California.

At Vine Hill the meteorological conditions are moderate and "tully-fogs" are frequent.

The large series was collected from beneath the bark on eucalyptus trees. These coccinellids were there to hibernate through the winter, and the individuals were congregated in groups of from two to twelve. They never congregate in such immense masses as do the *Hippodamiae*. Usually there was one *Olla plagiata* Casey with each of the groups, irrespec-

tive of whether they were made up of two or more individuals. The latter species is the one formerly known as *Cycloneda oculata* Fab., a variety of *abdominalis* before Casey removed it from the genus *Cycloneda* and placed it in the genus *Olla*.

Colonel Casey, in his revision of the Coccinellidæ, states that the large series of *Olla abdominalis* studied by him exhibited an extremely small amount of variation, which, considering its geographical range, is very remarkable. The following descriptive notes are taken from his diagnosis of the species:

Upper surface pale brownish-yellow, *head* pale and immaculate. *Pronotum* with a basal black spot at two-fifths from the middle and a short transverse spot before the scutellum, also with two posteriorly converging black spots at the center and a narrow elongate spot on the median line joining the ante-scutellar spot and, at lateral eighth and basal third, a small rounded spot. *Scutellum* black in the male. *Elytra* each with a subbasal transverse series of four small black spots, a median series of three spots, the medial the largest and transversely crescentiform and, at apical fourth near the margin, another small rounded black spot. *Legs* and under surface pale.

After a careful study of the series under consideration, thirty-one specimens were selected out of the two hundred and arranged so that at one extreme they tended toward albinism and at the other toward melanism. By selecting and classifying the variations in elytral maculation, it was possible to arrange them in ten series, as follows:

Series 1, fig. 1.—Subbasal transverse series of elytral maculæ small and subequal; median* macula of the median series obsolete, the medial and lateral maculæ larger than those of the subbasal series, the medial scarcely crescentiform; subapical macula very minute. Pronotal maculæ all rather widely separated, lateral macula minute. Scutellum and sutural margins of the elytra pale. Under surface and legs rufo-testaceous, except the metasternum, which is rufous, and the meso- and met-episterna which are distinctively whitish, the small epimera apparently concolorous.

A companion specimen to the one from which fig. 1 was drawn, is identical with the above, but the meso- and met-episterna are white, the mes-epimera apparently rufo-fuscout, and the met-epimera are white; the metasternum rufous, laterally rufo-piceous, the first two

*Note.—The adjectival terms lateral, median and medial refer to the maculæ in a series on each elytron.

abdominal segments are rufous centrally and each has a piceous macula laterally.

Series 2, fig. 2.—In the subbasal transverse series of small spots the second from the suture is distinctly enlarged and slightly more extended posteriorly; median macula of the median series present and very small, medial macula distinctly crescentiform and narrower; subapical macula larger. Sutural margins of the elytra concolorous with the disc. Pronotal maculae slightly less widely separated and the lateral macula larger. Under surface paler, as in the type of Series 1, except that the general color is more rufous and the side pieces scarcely whitish. Two companion specimens to the type of Series 2 are identical, except that the side pieces are more whitish.

Series 3, fig. 3.—Maculae of the subbasal series larger and subequal; maculae of the median series distinctly larger, the medial subcrescentiform, thicker and more irregular in outline, lateral macula slightly the largest. Pronotum with the posteriorly converging maculae nearer together and almost connected with the narrow elongated macula which is continuous with the ante-scutellar macula. Edge of the sutural margin of each elytron very narrowly nigrescent.

Under surface as in the type of Series 2. Four companion specimens to the type of the present series, vary as follows:—One has the under surface the same, but the side pieces of the sterna are whitish; the second has the metasternum and first two abdominal segments slightly piceous; the third has the metasternum nigro-piceous; the fourth is rufous beneath with the abdominal segments piceous centrally.

Series 4, fig. 4.—Medial and umbonal maculae larger than in the type of Series 3; median series with the lateral and median maculae slightly smaller, the medial thicker and more crescentiform; subapical macula distinctly larger and irregular. Pronotum with the maculae narrowly connected, forming an irregular M-shaped figure; lateral maculae larger and rounded. The mes- and met-episterna are whitish; metasternum and first two abdominal segments are rufo-piceous, remaining segments gradually becoming rufous to the fifth.

Seven companion specimens to the present type are variable in the color of the under surface, metasternum nigro-piceous, or metasternum and first three abdominal segments nigro-piceous to rufo-piceous, to entirely rufous; one specimen has the metasternum and four abdominal segments nigro-piceous, and the fifth segment rufo-piceous; another specimen has the mes-epimera nigro-piceous.

Series 5, fig. 5.—Maculae of all the series larger and more subequal, the medial of the median series distinctly thicker and less evenly crescentiform. Pronotal M-shaped maculation larger and heavier, connectants thicker. Lateral macula no larger than in the type of Series

4, and the limit in size. The metasternum and abdominal segments piceous, the latter moderately narrowly rufo-piceous at the sides.

Three companion specimens have the under surface about as in the type of the present series, but the pronotal maculae are more or less separated as in fig. 9.

Series 6, fig. 6.—Maculae of the subbasal series distinctly heavier and more irregular, the medial two of each side coalescing; median series of maculae slightly smaller than in the type of the preceding series and subequal, medial maculae less crescentiform; subapical macula slightly smaller than in fig. 5. Pronotal M-shaped maculation slightly less heavy. Under surface pale rufous, with the sides of the metasternum rufo-piceous.

Series 7, fig. 7.—Maculae of the subbasal series smaller, except the medial two; median series larger and more irregular, the medial and median of each side coalescing, the medial macula largest and more obtusangular; subapical macula large. Pronotal M-shaped maculation as in the type of Series 6, lateral macula smaller. Under surface pale as usual, with the sides of the metasternum slightly piceous. A companion specimen has the elytral subbasal series of maculae distinctly larger and subequal, the sub-apical macula rounded and subequal to the largest.

Series 8, fig. 8.—The second macula on each side of the suture in the subbasal series is distinctly extended posteriorly, and the sutural macula slightly produced anteriorly, both subequal, similar in form and larger than the lateral two; median series of maculae subequal in size and smaller than in type 7; subapical maculae as in Series 7. Pronotal M-shaped maculation a little heavier than in Series 7, lateral macula as in Series 6. The metasternum is rufo-piceous, the abdominal segments slightly paler rufo-piceous, laterally and apically more or less rufous. A companion specimen is similarly colored.

General color of the elytra within an area as shaded in fig. 8, distinctly pale scarlet, enclosed maculae are surrounded by a halo of the usual color. Several specimens in the original series had the entire elytra tinged with pale or obscure scarlet, the maculae with or without a halo.

Series 9, fig. 9.—The medial macula of the subbasal series is slightly produced posteriorly, the series as a whole apparently straighter, size of the maculae as in figs. 7 and 8; maculae of the median series larger than in Series 8 and very narrowly separated from each other, the medial macula being as distant from the suture as in all the preceding series; subapical macula as in fig. 4. The pronotal M-shaped maculation dissolved, the medial maculae very narrowly separated; lateral macula as in Series 7. Under surface of the type and two companion specimens dark, metasternum and abdomen nigro-piceous, terminal segment more or less rufous.

Series 10, fig. 10.—Maculae of the subbasal series nearly as in Series 8; maculae of the median series enlarged, the medial crescentiform, the lateral and median nearly coalescent, the median macula produced posteriorly and confluent with the subapical macula, the three forming an irregular figure-7 pattern. Pronotal M-shaped maculation again reconstructed as in Series 7 and 8. Under surface dark, as in Series 9.

Figure 11 is drawn from a specimen collected in Southern California, and kindly loaned to me by Dr. E. C. Van Dyke. The elytral maculation is self-explanatory after what has been said in the consideration of the preceding series. In the specimen the metasternum and abdomen are dark rufous, the central area of the abdomen is clear rufous. The mes- and met-episterna are distinctly whitish. The lateral macula of the median series nearly meets the marginal bead, the latter and sutural edge of the elytra are very narrowly piceous. The scutellum is fuscous. Two companion specimens collected at Old Fort Brown, Brownsville, Texas, on August 3d, 1906, by A. B. Wolcott and loaned to me by Mr. F. W. Nunenmacher, are quite identical in elytral maculation. In one specimen the under surface is rufous and the metasternum is rufo-piceous. In the other one the metasternum is nigro-piceous and the general color darker rufous. In both the mes- and met-episterna and met-epimera are distinctly whitish, the white extending caudad along the sides of the first two abdominal segments, and more dilated on the first segment in one specimen than in the other.

The coxal lines in both are black and the enclosed coxal plate is rufo-piceous. In one specimen the front of the head is fuscous; in both the marginal and sutural edges of the elytra are dark as in Series 10. The scutellum is fuscous.

A careful re-examination of Type 10 clearly determines that the white of the sternal side pieces extends backward on the first two abdominal segments.

Mr. Nunenmacher informs me that these extreme dark forms are more common in Mexico. They are rare north of the Mexican boundary, at least as far as we know here on the Pacific coast.

Figure 12 illustrates an extreme pale form taken in Arizona, and it appears to be rare. The white of the sternal side pieces is distinct and its extension backward upon the abdomen is also evident.

The extension of the white upon the sides of the abdomen occurs sporadically in specimens collected at Mokelumne Hill,

Calaveras County, California, elevation 2,300 feet. A series of four specimens collected by Mr. G. R. Pilate, at El Centro, Imperial County, California, is to be referred to Series 1 and 2 of the present paper.

The material just discussed does not in any way elucidate the relation between *Olla abdominalis* and *Olla plagiata* Casey.

The above interesting series has caused considerable speculation as to the factors which act to bring about this variation in pigmentation. The normal tendency in *Olla abdominalis* is toward albinism.

I desire to mention the conclusions or theoretical suggestions of W. L. Tower, who made his studies on *Leptinotarsa 10-lineata*. His experiments extended over a period of eleven years, and his results have been published by the Carnegie Institution at Washington.

Tower believes that color production in insects is dependent on the action of a group of closely related enzymes, of which chitase, the agent which produces hardening of chitin, is the most important. He demonstrates by a series of well-planned experiments that colors are directly modified by the action of external agencies, namely: temperature, humidity, food, altitude and light. Food chiefly affects the subhypodermal colors of the larvae, and does not enter much into account, the most important agents affecting the adult coloration being *temperature* and *humidity*. A *slight increase* or a *slight decrease* of *temperature* or *humidity* was found to stimulate the action of the color-producing enzymes, giving a tendency to *melanism*; but a *large increase* or *large decrease* of *temperature* or *humidity* was found to inhibit the action of the enzymes, producing a strong tendency to *albinism*.

There seems to be no logical reason why we should not reason from analogy. Let it be granted that there is such an enzyme as chitase or its analogues present during the earlier stages in the ontogenesis of insects and that temperature and humidity can produce the optimum state for the activity of such enzymes, just as they do for other ferments, notably those for the conversion of proteids into peptones,

or starch into sugar; or that a similar environment excites activity in organized ferments. Biologists contend that environment plays a very important part in the variation of organisms, not only in the modification of coloration, but also in sculpturing.

It is important to emphasize the necessity of observing large series of insects and of keeping very careful and detailed records of the meteorological conditions attending their ontogenesis under natural conditions, in order to correlate the observed facts with analogous data obtained through experimentation in the laboratory.

The collecting of large numbers of coccinellids necessitates some rapid and effective way of cleansing them after removal from the cyanide bottle. It is well known that these beetles throw out secretions from glands situated in the sides of their bodies and from articulations, besides regurgitating the ingesta.

It is recommended that the entire catch of the specimens, few or many in number, be placed in a vial and that they be covered with chloroform and gently shaken for about one-half of a minute. That the chloroform be then poured off into another vial and the insects shaken out upon a sheet of blotting paper to permit of the evaporation of the chloroform. They will then be perfectly clean, bright and shining with colors and sculpturing fully cleared for study.

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Some Observations on Mud Wasps (Hymen.).

By PHIL RAU and NELLIE RAU, St. Louis, Missouri.

A Wasp and Her Spiders.

A *Pelopoeus** was building her nest on the wall of the room behind a dark curtain, and about five feet from the floor. I came in time, 5 P. M., June 23, to see her seal up the first cell. By 1.30 the next day the second cell was three-quarters done, and by 10 o'clock the following morning it too had been completed and sealed. For five hours I watched for this builder to return to add the third cell, but it was not until 3.55 that she returned, bringing a pellet of mud. She alighted upon a highly-colored cover of one of the current magazines which lay on a soap-box by the wall. From this landing she walked slowly but directly to the wall and then straight up the wall for about 12 inches until exactly even with the nest, then taking a horizontal course she walked toward the nest, but when about 6 inches from it she hesitated, made a circle of perhaps $1\frac{1}{2}$ inches, hesitated again for a few seconds, then flew directly to the nest, made her deposit and immediately flew out again.

I removed the colored magazine cover upon which she had alighted when entering, thinking to confuse her. She returned after an absence of 30 minutes, but did not seem to miss her landmark, for when this was gone she alighted on the wall and went directly to the nest as before. By 4 o'clock the third cell was completed and the wasp was busy in carrying in spiders. While she was out hunting I removed four spiders from the nest of another wasp. They had the appearance of having been newly paralyzed. These I added to those already in the cell in order to find out whether the mother wasp could or could not recognize foreign prey. She returned with one spider, the booty of a half-hour's hunt, and flew to the nest with no difficulty, entered the cell, but left it immediately, buzzed around the room in one large circle and then back to the nest again, removed one of my spiders

* *Sceliphron* (*Pelopoeus*) *caementarium*.

and flew out of the window with it. She then removed the second and third and fourth spiders in precisely the same way.

She extracted the four foreign spiders and carried each one out of the window; why, pray, did she not drop them on the floor and spare herself the trouble of carrying them so far away? Having begun to carry out the foreigners, will she know when to stop, or will she blindly carry out her own victims as well? She returned and carried out a fifth spider by way of the window, then threw the sixth on the floor near the nest, while the seventh she dropped near the window sill. By this time her indignation had cooled sufficiently to permit thoughtful consideration, and for fifteen minutes she thrust her head in and out of the cell anxiously examining the contents, and finally flew away. I used this chance to examine the cell, and found that it was half packed with her own spiders.

Strange, strange creature! Since you commenced to remove the spiders, why did you not empty the cell? Could you distinguish your own victims from the intruders, and if so, why did you remove three of your own? Why, pray, did you not want the spiders which your sister had stung? They could not have differed much from your own, for if there had been a perceptible difference you would have stopped short with the fourth spider, and would not have carried off three of your own. Why did you spend a quarter of an hour in examining the contents of the cell after you removed the seventh spider, as if you were undecided whether you should leave the remainder?

It may be that in placing the four foreign spiders in the cell, the position of three of her own was disturbed in such a way that she, in all her wisdom, could not recognize them as her own. In examining the remaining spiders, I purposely disarranged them in the cell to see whether this would excite the same behavior. The returning mother was evidently much confused, for she spent two minutes by the watch, in packing them close together again and examining the cell very

minutely. Then she stood stock still at the entrance of the cell for nearly a minute before she would again enter it; then after examining the interior and the opening for five minutes more she flew away.

Since this mother *Pelopoëus* was so keen in recognizing spiders not of her own capture, an effort was made to determine whether she would recognize and remove an intruding larva of her own species if it were placed in her cell. Forthwith a five-day-old larva from another nest was placed in the cell, very near to the entrance. Now the wasps of this species never see any more than the egg of their young, since the egg does not hatch until after the nest is sealed. There is a vast difference between the egg of this wasp and a five-day larva,—such a difference that one would expect it to be taken for an enemy and removed at once.

The wasp returned, deposited the spider which she carried and flew away in the usual manner, paying no attention to the larva, even though she had to walk over it to deposit her load.

Shades of Moses! Good, healthy spiders that would have served as food for her young she removed just because she had no voice in the matter of their selection, and now she goes on supplying food for another mother's child, while her own will inevitably be starved, if not devoured, by this impostor!

I left the nest at 5 o'clock, and at 6 the next morning found that this cell had been sealed. I opened it and found that it contained 14 spiders. To the abdomen of one of these adhered her own larva, now 5 mm. in length. In addition to these, there was the large larva which we had placed there the day before, now almost a half inch in length and very fat. The wasp had the fourth cell half done when this, the third, was broken into during her absence, but she made no attempt to repair the broken cell. It seems that after a cell has once been sealed the interest therein is lost.

We remember the attitude of this insect toward the spiders taken from another wasp's nest and placed in her own. Now

we shall see the behavior of this very same wasp toward spiders removed from one of her own cells which had been sealed and placed in the cell now in the making. In the first experiment the borrowed spiders had been captured and handled by some other wasp. In this case they were taken by this very individual the day before and placed in a cell of the same nest. Will she carry these out as she did the others, or will she recognize them as her own brand?

The wasp returned, examined the inside and outside of the cell and nest for a half minute and then flew away, returning very soon with a spider which she tucked into the cell with the others without removing any of them, and with her head crowded and packed them into a compact mass. Soon it came with another spider, and while struggling to push it in it examined the entire nest carefully.

Since she did not remove her own spiders borrowed from yesterday's gathering, another attempt was made on this wasp to introduce spiders from another's nest. I removed the last one which she had brought in and substituted three others. This cell was now full to overflowing, twelve spiders from another cell of her own nest, three which she had captured for this particular cell, and three foreigners. She returned with another which she tried to cram in, but it fell to the floor. She then condensed the overflow by pounding and pushing them in with her head for exactly three minutes. She then soared out of the window and returned almost immediately with a pellet of mud which she spread over the entrance of the cell, and then another and another. If the insects are mere automata, as some writers would have us believe, why did not this one continue to bring in the spiders and try to crowd them into the cell until the usual quantity was reached? On the contrary, finding her cell full, she immediately packed it well and sealed it.

The item of interest is that the first time she removed the foreigners; then she left undisturbed the spiders of her own stinging, but from another cell; but on the third intrusion, when impostors were again introduced, she left them too un-

disturbed, but whether from ignorance or wise tolerance we do not know.

This cell also was opened to see if an egg had been deposited; it was discovered just as the mother wasp was coming with a load of mud. She was not observed that evening, but the next morning I expected to find the damaged cell repaired, but instead I found a new cell one-third completed, and no attention had been paid to the broken cell.

A Sleepy Eumenid.

A mud dauber's nest having several open cells, gave forth two wasps of the family Eumenidae* between 2 and 5 P. M. on May 31. Both of them occasionally took sweetened water from a wet cloth. At night, each crept into an empty cell of the nest, probably the one from which it had emerged. Up to 10 o'clock the next morning neither came out; a half hour later one was busily flying about the cage, and at 11 the other was doing the same. The remainder of the day they spent thus, and at 5 o'clock one of them retired into one of the two cells already mentioned, with its legs slightly protruding. Unfortunately, at 6.30 P. M. the second wasp escaped through an open window when the cage was lifted.

The interesting behavior of the remaining wasp was observed from day to day until its death on June 10. On June 2 it remained in the cell until noon, then came out and flew about until 2 P. M. and crept back into the nest again, always occupying the same cell. After three more days of this conduct, while the insect was out of the cell I placed a large drop of red jelly at the entrance. This must have confused the wasp, for it remained out all night, and the next day and night as well, and it was not until 4 P. M. of the third day that it retired into another empty cell (No. 2) at the far end of the nest. While I was examining the nest immediately after this, the wasp reappeared; at 4.30 the cage was made completely dark by placing a large box over it; when this was removed after twenty-five minutes the insect had retired into an untried

* Identified by Mr. S. A. Rohwer, through the kindness of Dr. L. O. Howard, as *Ancistrocerus unifasciatus* Sauss.

empty cell (No. 3), but it emerged again very soon after the cage became light. This experiment was repeated from 6 to 6.30, but the wasp could not be fooled into going to bed the second time.

The insect continued to use this cell (No. 3) for its retreat until 5 P. M., June 7. The next morning at 8, it was occupying cell No. 1, having migrated from No. 3 during the night; at 1.30 P. M. it was occupying No. 2. June 9 until noon it again occupied No. 1. It flew about all the afternoon and probably all night for the next morning it was still active. At 10 o'clock the insect and cage were placed in intense sunlight. By 11 the wasp cowered in the only shade that the cage afforded, that made by a small string tag bearing the cage number. This ticket was then removed to compel the insect to remain in the bright sunlight. It moved about slowly, however, and in forty minutes I found, to my surprise, that it was dead.

In keeping *Pelopoeus caementarium* of both sexes in confinement I have never observed them to enter their old cells, much less to remain there for hours.

A Wasp and her Nest.

A *Pelopoeus* (*Sceliphron* (*Pelopoeus*) *caementarium*) was discovered making her nest in an open soap box which stood on end partly facing an open window about three feet distant. Through this window the wasp made her entrance and exits. A roll of carpet on the floor extended into the box, barely touching the bottom, which now served as the back wall. On this wall just beneath the carpet was hidden the nest in course of construction, which now had two cells. The nest was first found by following the wasp. While the little builder was gone I pulled the carpet out about six inches. The carpet was undoubtedly associated in the wasp's mind with the location of the nest, for when she returned she was in an extremely confused state for about twenty-five minutes; much of this time she spent in examining the rug. It was necessary for me to leave without knowing whether she found the nest, but upon examining it two days later I found a third cell completed and the mother filling it with spiders.

I then removed the rug to a distance of two feet; when the wasp returned she flew through the window, alighting on the floor and then she walked directly into the box in a straight line and then up the back wall to the nest. In leaving, this insect would never fly directly off the nest and out the window, but would walk down the back of the box to the floor and then along the floor to the window.

I then laid a blue-covered book directly on the wasp's path in the box. The insect, entering in the usual way, walked around the edges of the book, hesitated for a few seconds at the farthest corner and then climbed up the wall directly to the nest.

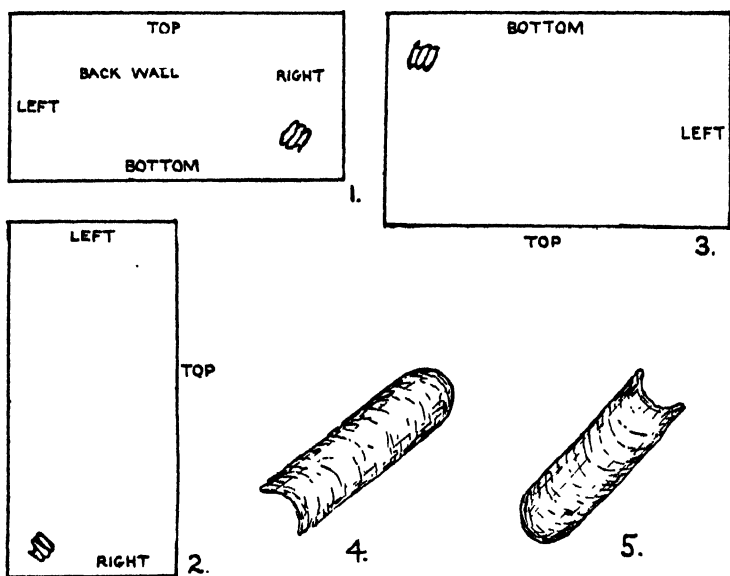
After she had again left we placed a large ball of colored yarn on the floor of the box, completely hiding the nest from view. The returning wasp paid no attention to this, but walked past and went into the nest. Perhaps she was becoming accustomed to being annoyed. This ball was removed after her departure, and the roll of carpet was placed midway between the window and the box directly over the insect's path, so that when she should return she must either walk around the roll or fly over it. The wasp entered and alighted on the floor near the window in the usual way, and then flew over the carpet and into the box containing the nest and up the wall as usual. It is interesting to note that previously the wasp had flown in from the window to the floor and walked the distance to the box; after the roll of carpet was placed upon its path it flew, entered as usual, and then made another flight to get over the carpet instead of walking over it.

After the wasp left, a brightly colored pillow was so placed in the box as to entirely hide the nest from view but not deny access to it. The returning insect was confused and made ten flights around the front and sides of the object, but when making these side trips it would invariably come to the front again, when by remaining at the sides it was nearer home, about twelve inches distant. The eleventh and longest flight brought the excited insect into its usual path on the walls of the box; then it had no trouble in going direct to the nest.

The insect, upon its next entrance required eight flights around this obstruction before it could find the back wall of the box, but after this was located, the nest was soon found.

After the wasp left again, everything to confuse it was removed and on its return it flew to the floor and walked to the nest in the old way.

Figure 1 shows the exact position of the nest in the box, just three inches from the floor. The box offered a convenient opportunity for attempting to confuse the builder by turning



the nest about. The box was therefore shifted about on the original spot so as to bring the nest into several different positions.

The box was first turned so that the right side became the bottom; this brought the nest into the position indicated in Figure 2. Originally the openings of the cells had pointed downward; this change brought the openings to face upward, and the nest which before had been on the right side of the box was now on the left.

Presently the wasp returned, walking up one side of the box

in the usual way, but soon perceiving that something was wrong, she flew around nervously in the box, then ran around on the bottom for a few seconds, and finally flew up to the nest, but she did not remain long there but flew in and out the box many times, each time alighting on the nest, always examining its bottom (in its former position the openings were at the bottom; now they were at the top). It seemed that she could not conceive of how the bottom had become sealed during her absence. This examination of the bottom she repeated eleven times. Then once more she flew to the nest and the hum which means work could be heard. She had at last found the opening of the unfinished cell and was now disposing of the pellet which she had carried during all this confusion. Upon leaving the nest this time the insect made a flight of orientation; on returning it flew in from the window to the floor, walked direct to the box, and then in uncertain lines to the nest, disposed of its pellet and this time left without a flight of orientation.

Again I moved the box to a position at right angles to the rays of light, instead of diagonal as heretofore, and so that the part marked bottom in Figure 1 was now the top. This made the position of the nest as shown in Figure 3. The insect returned, but this time it flew from the floor into the box in its new position, making three circles, each one smaller than the last, and then walked straight to the nest. Here she exhibited much confusion seeking for the spot on the unfinished cell where the pellet which she carried ought to be placed. Soon she left the nest in apparent anxiety or disgust and for fully two minutes she walked hither and thither about the box and then soared straight out the window. It was observed that when she departed she did not carry out the mud pellet, and an examination of the cell revealed a new layer of mud. I had not been keen enough to catch her at her nimble work. After one-half minute she returned with another pellet, this time making a bee line from the window to the nest as though she were fully accustomed to coming to the nest in this position. The next morning I found this cell completed but not sealed.

Figure 4 is the position of the cell when commenced, with the opening toward the light; Figure 5 gives the position in which it was finished, with the opening away from the direct source of light.

It is interesting to note that while the cell was begun on a downward slope, it was finished on an upward slope.

At 4 P. M. I found the mother filling this with spiders. I pulled the last spider out of the cell and deposited it just at the opening. The returning wasp entered at the window and after making a few circles it flew into the box and directly to the nest where with its head it pushed the protruding spider into the cell and deposited another, but it seemed just a little confused. Upon returning later in the afternoon I found that she had completed the cell and sealed it securely. I knew that if she should return now it would be for the purpose of adding other cells. To test her ability to repair any damage done to the cell I removed the soft covering which sealed it. It was now 5 P. M. and I left, but the next day I found that the damaged spot had been repaired and the fifth cell begun. Perhaps the wasp returned to add another cell to the nest and accidentally covered the opening without knowing that vandalism had been committed. Perhaps she realized that mischief had been done, for while I waited all day she never returned, and although I watched this nest from day to day for a week I found no evidence of new work, so I fully suspect that she had no desire to be crossed in her work.

Hungry Larvae.

A larva of *Trypoxylon albitarse* had completely exhausted the supply of spiders which had been provided for it, but had not yet made its cocoon. This gave an opportunity to see if a larva would eat more than the usual amount of food provided for it.

A large spider was removed from another nest and placed with this larva. Within six hours this had been devoured. Then two other large spiders were placed in the cell, and when an examination was made two days later it was found that the

larva had devoured one whole spider and half of the other and was now enclosed in its cocoon.

This simple experiment shows that this larva reached the limit of its capacity at two and-one-half additional spiders. This overfeeding was not injurious to the insect, because later it transformed into a normal adult.

The same experiment was carried on with another individual of the same species, which had eaten all of its food. At 9 P. M. on August 6, an additional large spider was introduced and commenced upon immediately, and by 7 the next morning it had entirely disappeared. A second large spider was eaten during the day and a third one was promptly pounced upon when it was introduced into the cell. The next day I found the larva had spun its cocoon, three-fourths of the last spider remaining. So this one was also able to increase its capacity to hold two and one-fourth spiders more than its original supply. It also eventually emerged as a normal adult.

David Sharp quotes Peckholt, who says, in speaking of this species*: “. . . however great may be the number of insects placed by the mother wasp in the cell, they are all consumed by the larva, none ever being found in the cells after the perfect insects escape therefrom.”

That the larvae are greedy is substantiated by our observations, but our experiments demonstrate that there is a limit to their capacity, since both larvae pupated despite the fact that they could have gone on eating as long as I supplied the spiders.

Wasps Which Resented Intruders.

An Eumenid† nest (one cell) contained five small caterpillars. During the absence of the mother wasp, three spiders were taken from a *Pelopoeus* nest and placed in this cell. After two hours the wasp returned—two hours in search of a small green caterpillar. After hovering about the nest for a minute and a half she entered, but came out almost immediately, carrying one of the spiders and flew with it out of the window.

* Cambridge Nat. Hist., Insects, Pt. 2, p. 119.

† Probably same species as recorded on p. 396.

How far she carried it is not known, but she was gone for five minutes. The second spider, which was larger, must have caused more trouble, for the rear end of the wasp protruded from the cell as she tugged away at it, occasionally coming out entirely, but soon going back to again grapple with the impostor. After five-and-a-half minutes she succeeded in carrying it out of the nest, but did not fly out of the window with it this time, but dropped it to the floor very near to the nest. The wasp then went to work on the third spider, this one larger than either of the other two. After five minutes she succeeded in bringing it just to the entrance of the cell where, with only the least bit of effort it would have dropped to the floor, but instead of expending this last bit of energy the wasp flew away, straight out of the window. She did not return in an hour, but the next morning the spider was gone.

During the absence of the *Pelopoëus*, one-fourth of a match was broken off and placed in the open cell, partly protruding. The returning wasp buzzed nervously about for three minutes, examining the surrounding wall and cracks. One would almost suspect that she was deliberately seeking a location for a new nest, when suddenly she turned back to the cell, pulled the stick out with her jaws and dropped it to the floor. She evidently hesitated about entering, however, for she skeptically thrust her head into the cell several times and then left. During her absence a whole match was placed in the cell with more than half of its length protruding. After three minutes the wasp returned, flew wildly in all directions and circles about the room and dashed out the window, never to return.

Position of the Nests in Relation to the Light.

Whether wasps build their nests in any particular direction with relation to the source of light is difficult to discover, since the places which commonly harbor these nests usually have many sources of light. But we were fortunate in discovering eleven mud nests in an old corn crib which was lighted by only two small windows in the north wall.

The positions of the nests relative to the light were as follows:

4 nests (7, 2, 2 and 1 cells) facing north, toward light.

2 nests, (1 cell) facing south, away from light.

3 nests, (2, 2, 1 cells) facing west, partly away from light.

2 nests, (5 and 2, cells) facing east, partly toward light.

There were, then, six nests made facing the light and five with the openings away from the light.

In another room some 15 wasps were building behind the loose paper on the wall, almost, if not entirely, in complete darkness.

The Neotropical Tipulidae in the Hungarian National Museum (Diptera).—I.

By CHARLES P. ALEXANDER, Ithaca, N. Y.*

(Plate XIV.)

Through the kindness of Dr. Coloman Kertész, I have been able to examine and study the South and Central American crane flies in the collection of the Hungarian National Museum at Budapest. This collection of Tipulidæ, although not containing an unusual number of specimens, included a considerable number of interesting species which will be discussed in this and succeeding papers.

Subfamily LIMNOBINAE.

Tribe I—LIMNOBINI.

Genus *Dicranomyia* Stephens.

1829. *Dicranomyia* Stephens; Catal. Brit. Ins.; vol. 2, p. 243.

Dicranomyia subdola, sp. n. (Pl. XIV, Fig. 1).

Wings hyaline, veins of the wing margined with brown; tips of the femora yellow; abdomen annulated brown and yellow.

Female.—Length, 7.8 mm.; wing, 10.6 mm.

Rostrum and palpi dark brown; antennæ greyish brown, the flagellar segments much darker, brown; front, vertex and occiput greyish brown with numerous black hairs.

Pronotum brownish yellow, dark brown medially. Mesonotal præscu-

*Contribution from the Entomological Laboratory, Cornell University.

tum yellowish brown, a broad dark brown median stripe extending the length of the sclerite; scutum with the lobes brown, median space brighter, more yellowish; scutellum brown broadly margined with yellowish; postnotum dark brown. Pleuræ broadly dark brown becoming much lighter colored on the sternum. Halteres rather long, base of the stem pale, darkening into brown.

Legs, coxæ and trochanters light yellow, femora yellowish brown darkening toward the tip, the apex broadly yellow, tibiæ and tarsi brown.

Wings subhyaline, a brown quadrangular stigma, narrow brown seams along the cord, at the tip of *Sc* and along *Rs*, on the outer deflection of cell 1st *M*₂ and less distinctly along most of the longitudinal veins. Venation, (see plate XIV, fig. 1) *Sc*1 ending beyond the origin of *Rs*, *Sc*2 also beyond *Rs*, its length about equal to *Sc*1, basal deflection of *Cu*1 about at the fork of *M*.

Abdomen, tergites with the basal half of each segment dark brown, the apical half abruptly yellow; sternites similar beyond the first segment.

Holotype, ♀, Callanga, Peru, in the Hungarian National Museum.

Closely related to *andicola* Alexander, of Bolivia (Can. Ent.; vol. 44, pp. 362, 363; pl. 11, fig. h), differing in the lack of lateral præscutal stripes, much more extensive brown pattern on the wings, position of *Sc*2, etc.

***Dicranomyia tricincta*, sp. n.**

Wings with a reticulated pattern, a supernumerary cross vein in cell *R*₃; femora with three subequal, equidistant brown rings.

Male.—Length, about 7-7.5 mm.; wing, 10.3 mm. Hind leg, femur, 8.8 mm.; tibia, 9 mm.; tarsus, 5.7 mm.

Closely related to *D. muscosa* End.¹ of Ecuador, differing as follows: Head rich brown without a yellowish tinge; legs with the femora light yellow with three broad equidistant brown bands, the first premedian, the second postmedian, the last subapical, these annulations occurring on all the legs, tibiæ a little darker at the tip, two terminal tarsal segments brownish. In *muscosa*, the legs are bright greenish yellow, the apical third of the femora yellowish, before the tip with a broad pale grey ring, tibiæ and tarsi bright brownish yellow. With *muscosa* it agrees in its irregularly reticulated wing pattern, presence of a supernumerary cross vein in cell *R*₃, green cast to the body, etc.

Holotype, ♂, Callanga, Peru, in the Hungarian National Museum.

(1) Enderlein, Zool. Jahrbuch., vol. 32, pt. 1, pp. 75, 76, fig. W¹; 1912.

Genus *Rhipidia* Meigen.

1818. *Rhipidia* Meigen, System. Besch., vol. 1, p. 153.

Rhipidia domestica angustifrons Alexander (1912).

Alexander, Bull. Brook. Ent. Soc., vol. 8, pp. 16, 17; pl. 1, fig. ♀.

One ♀ from Callanga, Peru.

Rhipidia, sp.

One ♀ from San Bernardino, Paraguay. Fiebrig, 1908. It is allied to *domestica* but the antennæ are entirely lacking and closer identification is impossible.

Rhipidia, sp.

One ♀ from Asuncion, Paraguay. Vezényi, 1904.

Genus *Geranomyia* Haliday.

1833. *Geranomyia* Haliday; Entomol. Magaz., vol. 1, p. 154.

Geranomyia valida Loew. (Pl. XIV, Fig. 2).

1851. *Aporosa valida* Loew.; Linnæa Entomologica, vol. 5, p. 398.

One ♀, Concepcion, Chile, 1903; P. Herbst, coll.

A few additional details to Loew's characterization may be given. Proboscis split at tip, each lip recurved, the palpi very short and stout. Legs stout, coxæ, trochanters and femora yellowish, not darkened; tibiæ yellowish brown; tarsi, segments 1-3, brownish yellow, narrowly brownish at the tip of each, segments 4 and 5, brown. Wing venation (see plate XIV, fig. 2). Length, about 6.5 mm.; wing, 9.6 mm.; rostrum, 2.2 mm.

Geranomyia numenius, sp. n. (Pl. XIV, Fig. 3).

Rostrum long, thorax reddish brown, the præscutum with three pale vittæ and a dark brown median stripe; femora with a dark subapical ring; wings spotted, Sc long.

Female.—Length (excluding rostrum), 9.3 mm.; wing, 9.2 mm.; proboscis, 6.2 mm.

Proboscis dark brownish black; antennæ almost black, the flagellar segments elongate-cylindrical; front, vertex and occiput grey.

Pronotum light grey with a broad dark brown median vitta. Mesonotal præscutum rich reddish brown divided by three pale longitudinal whitish grey stripes, the median one broad and bisected by a narrow dark brown line which begins just behind the front margin of the sclerite and runs to the suture, the pale lateral vittæ narrow, enlarged at their anterior end before the pseudosutural fovea and run to the suture; scutum, scutellum and postnotum rich reddish brown, the latter with a paler median line. Pleuræ pale testaceous brown, darker

on the mesopleuræ, more greyish behind. Halteres, stem pale, knob brown.

Legs, coxæ and trochanters dull yellow, femora light brownish yellow with a rather broad subapical ring, tibiae light brown, the tip a little darker; tarsi brown.

Wings slightly infuscated with four brown marks along the costal region, the second at the origin of *Rs*, the third at the tip of *Sc*, the fourth at the stigma; pale greyish seams along the cord and along the outer end of cell 1st *M*₂. Venation (see plate XIV, fig. 3); *Sc* long, ending opposite or beyond the middle of *Rs*; *Sc*₂ equal to *Sc*₁; *Rs* rather long, strongly arcuated at its origin. There is a supernumerary cross vein in cell *Sc* between the base of the wing and the origin of the sector, such a condition being rather frequent in this genus.

Abdominal tergites dark brown, sternites much paler, yellowish.

Holotype, ♀, Callanga, Peru.

Paratype, ♀, Callanga, Peru.

Types in the Hungarian National Museum.

The paratype lacks the blackish median præscutal vitta.

G. numenius is allied to *insignis* Loew (1), but the antennal flagellum is black, not brown; thorax without three clear opaque brownish black stripes, etc.

Geranomyia cinereinota, sp. n. (Pl. XIV, Fig. 4).

Rostrum short; thoracic notum grey with a well defined blackish median stripe; femora uniform in color, wings subhyaline.

Male, length (excluding rostrum), 5.1 mm.; wing, 6.8 mm.; rostrum, 1.8 mm. Female, length (excluding rostrum), 5.2 mm.; wing, 7 mm.

Male.—Proboscis short, scarcely extending beyond the wing basis, dark brownish; antennæ dark brown; head grey densely clothed with long, black hairs.

Cervical sclerites blackish with a little greyish bloom. Mesonotal præscutum grey with a broad brownish black median stripe, the sides of the sclerite darkened, almost black, the ground color brightest in front on either side of the median vitta, more suffused with brownish behind; scutum, scutellum and postnotum light grey. Pleuræ grey suffused with darker. Halteres short, yellowish, the knob brown.

Legs, coxæ and trochanters yellowish, femora dull yellow, tibiae light brown, tarsi brown.

Wings subhyaline, iridescent, veins *C*, *Sc* and *R* more yellowish, remaining veins brown. Venation (see Plate XIV, fig. 4).

Abdominal tergites dark brown, sternites dull yellowish.

In the female the rostrum is even shorter, scarcely exceeding the antennæ in length.

Holotype, ♂, Coroico, Bolivia.

Allotype, ♀, with the type.

Paratypes, 40 ♂ ♀, Bartica, Brit. Guiana (H. S. Parish, coll.).

Types in the Hungarian National Museum; paratypes in author's collection.

G. cinereinota is allied to *diversa* O. S. of the Eastern U. S., but has a long *Sc.*, and a different thoracic- and wing-pattern.

***Geranomyia scolopax*, sp. n.**

Rostrum short, barely exceeding the antennæ in length; thoracic notum greyish brown with dark brown stripes; legs uniform; wings hyaline with three brown costal spots.

Male.—Length, 5.3 mm.; wing, 7 mm.

Proboscis short, scarcely longer than the antennæ, dark brown; antennæ dark brownish black; head grey.

Mesothoracic præscutum greyish brown, with an ill-defined, darker median stripe and the lateral margin of the sclerite dark brown, this color being the continuation of the dark propleuræ, scutum dark brown; scutellum and postnotum a little lighter. Pleuræ light brown with a broad greyish brown band extending the length of the thorax above the base of the halteres and below the wing root, becoming confluent with the postnotum. Halteres pale, the knob a little brown.

Legs, coxæ and trochanters yellow, fore femora dull yellow, tibiæ and tarsi brown; middle and hind legs brown excepting the coxæ and trochanters which are yellow.

Wings hyaline, or nearly so, with a distinct oval, brown stigma, a brown cloud at the fork of *Sc* including the base of *Rs*, cell *Sc* with a brown cloud at one-half its length. Venation: *Sc* rather short, ending a little beyond the origin of *Rs*; *Sc*₂ at the tip of *Sc*₁; basal deflection of *Cu*₁ at the fork of *M*.

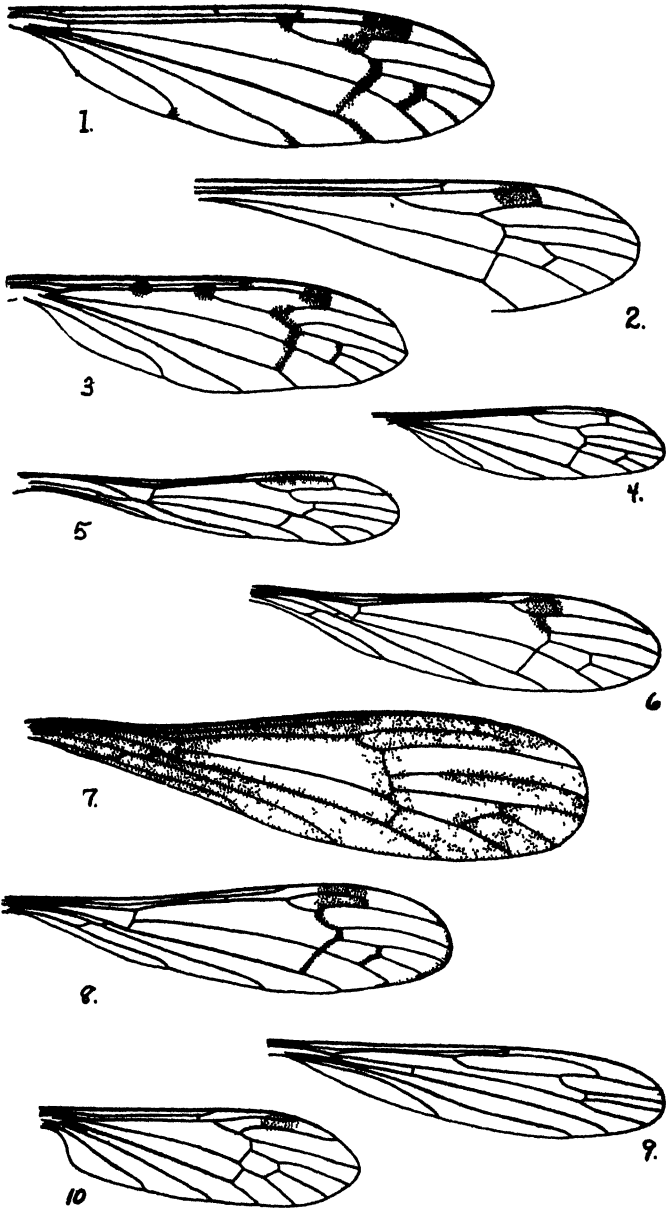
Abdominal tergites rich brown, the extreme base of each segment pale; the lateral edge and an indistinct median vitta brown; sternites brown.

Holotype, ♂, Callanga, Peru, in the Hungarian National Museum.

Closest to *cinereinota*, sp. n., but with distinct spots on the wing and with the median præscutal stripe ill-defined.

Genus *Peripheroptera* Schiner.

1866. *Peripheroptera* Schiner; Verh. Zool. bot. ges. Wien; vol. 16, p. 933.



NEOTROPICAL TIPULIDAE—ALEXANDER.

This remarkable genus of flies is apparently confined to the tropics of South America. Specimens are rare in collections and the few that have been taken are all contained in European museums. The peculiar characters of the genus, for the most part alar and venational, are thoroughly discussed by Osten Sacken in the second part of his "Studies on Tipulidæ" (Berl. Ent. Zeitschr., vol. 31, pp. 174-177). The present collection contained specimens of four species of which three are herein considered as new.

Key to the Species of Peripheroptera.

1. Cell 1st *M*₂ open; [thorax black shining; inner end of cell *R*₃ anterior to that of cell *R*₅] (Brazil, Bolivia).
incommoda O. S. (1)
 Cell 1st *M*₂ closed, i. e., crossvein *m* present 2
2. Body color shining pitch black 3
 Body color more or less reddish or yellowish 4
3. Inner ends of cells *R*₃, *R*₅ and 1st *M*₂ about in a straight line; femora yellow basally darkening into brown at the tip. (South America) *aberrans* Schin. (2)
 Inner ends of cells *R*₃ and 1st *M*₂ much farther proximad than the inner end of cell *R*₅; legs black. (Peru).
teucholaboides sp. n.
4. Wings conspicuously margined with brown all around; a broad brown seam along the cord; [cell 1st *M*₂ elongated; inner ends of cells *R*₃, *R*₅ and 1st *M*₂ in a line.] (Peru).
eudorae sp. n.
 Wings hyaline or suffused with yellowish; no distinct brown caudal margin to the wing 5
5. Inner ends of cells *R*₃, *R*₅ and 1st *M*₂ nearly in a line. (Brazil).
schineri O. S. (3)
 Inner ends of cells *R*₃, *R*₅ and 1st *M*₂ not in a line, that of *R*₅ being much farther distad 6
6. Abdomen entirely light brownish yellow; triangular basal cell (♀) very much shorter than cell *R*. (Peru).....*arcuata* sp. n.
 Abdomen darkened toward the tip; triangular basal cell (♂ ♀) almost as long as cell *R*. (Colombia).....*nitens* Schin. (4)

(1) Osten Sacken, Berl. Ent. Zeitschr.; vol. 31, p. 176 (1887).

(2) Schiner, Novara Reise, Dipt., p. 43 (1868) (as *Rhamphidia*).

(3) Osten Sacken, Berl. Ent. Zeitschr.; vol. 31, p. 177 (1887).

(4) Schiner, Novara Reise, Dipt., p. 47, pl. 2, fig. 3 (1868) (type of the genus).

Peripheroptera incommoda Osten Sacken (Pl. XIV, Fig. 5).

One male from Coroico, Bolivia, agrees very well with the original description of this species. It measures 3.5 mm. in length of body and 5.4 mm. in wing length. I include a figure of its venation. (See Plate XIV, fig. 5).

Peripheroptera teucholaboides, sp. n. (Pl. XIV, Fig. 6).

Head dull brown; thorax shining black; wings hyaline with a small brown stigma.

Male.—Length, 4.8 mm.; wing, 6 mm.

Rostrum and palpi dark brown; antennæ dark brownish black, the flagellar segments short, rounded; front, vertex and occiput dull reddish brown.

Thoracic dorsum shining black; pleuræ black, with a bluish grey bloom on the mesopleuræ. Halteres brown, the base of the stem lighter.

Legs long and slender, entirely black.

Wings hyaline, a small dark brown stigma and a narrow seam of the same color on the deflection of *R* 4 plus 5; veins brown. Venation (see Plate XIV, fig. 6), triangular basal cell very short and small; *Sc*₁ ends just before the origin of *R*_s; deflection of *R* 4 plus 5 a little shorter than *R*_s but strongly arcuated; inner end of cell *R*₅ farther distad than those of *R*₃ and 1st *M*₂; basal deflection of *Cu*₁ at fork of *M*. Anal angle of the wing feebly indicated.

Abdomen shiny black.

Holotype, ♂, Callanga, Peru, in the Hungarian National Museum.

P. teucholaboides bears a strong superficial resemblance to *Dicranomyia moriodes* O. S. (East. U. S.) and to certain of the tropical forms of *Teucholabis*. It is much nearer to the normal Limnobiine type than any of the other known species of the genus in that the male venation and alar characters are about as in the females of the other species, i. e., small triangular basal cell, small stigma, indication of an anal angle to the wing, etc.

Peripheroptera eudorae, sp. n. (Pl. XIV, Fig. 7).

Thorax reddish; wings margined all around with brown, a broad brown seam along the cord.

Male.—Length, 5.4-6 mm.; wing, 8.2-10.1 mm.

Rostrum and palpi reddish brown; antennæ, first segment brown, remaining segments dark brownish black; front, vertex and occiput shiny reddish chestnut, the occiput rather narrowed caudad to meet the elongated cervical sclerites, genæ yellowish brown.

Pronotum shiny chestnut; mesonotal præscutum rich yellowish chestnut, very shiny, in front much darker, brownish, this brown mark ill-delimited; scutum reddish brown, blackened on the outer cephalic angles of the lobes; scutellum and postnotum liver brown. Pleuræ deep yellowish chestnut without markings. Halteres short, brown.

Legs, coxæ and trochanters brownish yellow, base of femora yellowish, soon darkened into brown, tibiæ and tarsi brown.

Wings, yellowish, with distinct brown markings, the whole margin of the wing is brown, rather interrupted at the distal ends of the radial cells where the yellow ground color continues to the wing margin; cord broadly margined with brown. The yellow color is distributed as follows: Most of cells *R* and *M*, tip of cell 2nd *R*₁, most of cell *R*₃, basal half of *R*₅, middle of 1st *M*₂, indistinct spots in the bases of *M*₁ and *M*₃, and a patch in cell *Cu*₁. Venation: Costa strongly incrassated near the end of *Sc*₁; *Sc*₁ ends opposite the origin of *R*₅; *R*₅ short, about equal to the deflection of *R* 4 plus 5; inner ends of cells *R*₃, *R*₅ and 1st *M*₂ in a line (see Plate XIV, fig. 7).

Abdominal segments almost black, each sclerite with a broad pale silvery apex.

Holotype, ♂, Callanga, Peru.

Paratype, ♂, Callanga, Peru.

Types in the Hungarian National Museum.

Peripheroptera arcuata, sp. n. (Pl. XIV, Fig. 8).

Thorax yellowish, a dark brown median mark on the præscutum, wings with the deflection of *R* 4 plus 5 strongly arcuated and not in a line with the inner end of cell *R*₅.

Female.—Length, 5.6 mm.; wing, 6.8-7.8 mm.

Rostrum and palpi brown; antennæ, basal segments dull yellow, flagellar segments brown; front and vertex grey, this color continued caudad along the inner margin of the eye, caudal portions of the vertex and the occiput brownish yellow, head not shiny.

Thorax rich brownish yellow, a little shining, a conspicuous, elongate oval, dark brown stripe on the præscutum, this mark truncated in front, more pointed behind; scutum, scutellum and postnotum dull yellow, not shiny. Pleuræ dull yellow. Halteres light yellowish brown, knobs dark brown.

Legs, coxæ and trochanters light yellow, femora yellowish darkening into brown toward the tip, tibiæ and tarsi brownish.

Wings with a faint yellow tinge, most intense along cells *C* and *Sc*; stigma indistinct rather small, cord and tip of the wing very indistinctly suffused with brown. Venation (see Plate XIV, fig. 8), cross vein *r* angulated near its middle, strongly arcuated and with indications of a spur; *R*₅ rather long, not so arcuated as the deflection of *R* 4 plus 5 which is bent almost at a right angle and is much proximad of the

inner end of cell *R*₅ though about on a line with the inner end of cell 1st *M*₂.

Abdomen brownish yellow without dark markings.

Holotype, ♀, Callanga, Peru.

Paratype, ♀, Callanga, Peru.

Types in the Hungarian National Museum.

EXPLANATION OF PLATE XIV.

- Fig. 1. Wing of *Dicranomyia subdola* sp. n.; ♀.
 - Fig. 2. Wing of *Geranomyia valida* Loew.; ♀.
 - Fig. 3. Wing of *Geranomyia numenius* sp. n.; ♀.
 - Fig. 4. Wing of *Geranomyia cinereinota* sp. n.; ♂.
 - Fig. 5. Wing of *Peripheroptera incommoda* Osten Sacken; ♂.
 - Fig. 6. Wing of *Peripheroptera teucholaboides* sp. n.; ♂.
 - Fig. 7. Wing of *Peripheroptera eudorae* sp. n.; ♂.
 - Fig. 8. Wing of *Peripheroptera arcuata* sp. n.; ♀.
 - Fig. 9. Wing of *Diotrepha omissinervis* sp. n.; ♀.
 - Fig. 10. Wing of *Atarba varicornis* sp. n.; ♀.
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A Hale and Hearty Entomologist.

On June 13, 1913, Hofrat Dr. Karl Brunner von Wattenwyl celebrated his ninetieth birthday in "voller geistiger Frische und körperlicher Rüstigkeit." On this occasion he was visited at Kirchdorf on the Krems, where he was spending the summer, by a deputation of his numerous friends, who presented him with addresses recalling his distinguished services in the organization of the telegraph in Austria and in the field of Orthopterology.—(*Wiener Ent. Zeitung*, July 15, 1913).

Mexico Gulf Coast Citrus Fruit Association.

I am sending you under separate cover a copy of the first circular of this Association, on the control of the Orange Maggot (*Trypeta ludens*—Dipt). We are conducting investigations on many problems relating to the culture of citrus fruits in the tropics and the subsequent circulars will treat of these various problems, which will be largely entomological, and some also on phytopathology, etc. I will be glad to send these to anybody who is especially interested in this work; especially in such cases as other bulletins or papers may be received in exchange.

I would be glad if you might make a mention of the above facts in the *News*. We are devoting a great deal of attention to these matters and we believe that the results will be of interest to many outside of Mexico.—D. L. CRAWFORD, Entomologist and Horticulturist, P. O. Box 293, Tampico, Tamps., Mexico.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., NOVEMBER, 1913.

A little learning is a dangerous thing:

Drink deep, or touch not the Pierian spring.

"San Jose Scale; a Parasite Which Kills the Orchard Pest is Found. Most Important Horticultural Discovery of Recent Years Officially Announced by State Zoologist. Certain That it Has Cleared up Orchards." The above appeared in the *Philadelphia Public Ledger*, September 26, 1913, and was followed by a detailed statement by Prof. H. A. Surface, Economic Zoologist of the Pennsylvania State Department of Agriculture. The discovery, according to Prof. Surface, has been pronounced the most remarkable horticultural work of years, if not of the entire decade. Dr. James S. Grim, instructor in the Kutztown (Penna.) State Normal School, claims that he discovered these parasites and sent them to Prof. Surface. All this has caused a wordy newspaper war between Prof. Surface and Dr. Grim as to priority of discovery.

A natural inference would be that a State Zoologist would look into the literature of the subject and have the specimens identified before rushing into print. There are numerous Hymenopterous parasites infesting the San Jose scale and a voluminous literature exists relating to the subject. Marlatt (in Bulletin 62, Division of Entomology, U. S. Dept. of Agri-

culture, 1906) mentions eight species as having been reared from the San Jose scale in this country. The literature of the subject practically dates from the description of the scale in 1880 by Professor Comstock. D. W. Coquillett reared *Aphelinus fuscipennis* Howard in California in the eighties. It was also reared by Ehrhorn, Craw and others in California years ago. In 1898 the late Prof. W. G. Johnson reared nearly four thousand specimens from scale found in Maryland. This species was also reared and studied a long time ago by John B. Smith in New Jersey and Prof. Forbes in Illinois. Girault reared *Aphelinus mytilaspidis* LeBaron in Washington, D. C., in 1905. *Aspidiotiphagus citrinus* Howard has been reared from the scale from Florida. *Physcus varicornis* Howard was reared by Prof. Quaintance in Florida, also in 1905. Quaintance and Girault also reared *Prospalta aurantii* and *Ablerus clisiocampae* Ashm. *Rhopoideus citrinus* Howard was reared in 1885 by Albert Koebele at Truckee, California.

This brief abstract from Mr. Marlatt's work shows that something was known of San Jose scale parasites before Prof. Surface made his marvelous discoveries in Pennsylvania. Of course it is possible that he or Dr. Grim has reared a new species, but even that will not excuse lack of reference to the literature, as there is no evidence that he knew what parasite or parasites he had.

The Pennsylvania State Zoologist appears also to claim priority in other things. In Press Bulletin No. 194, dated January 13, 1913, he says:

"Thoughtful readers of newspapers have been very much amused recently to see an article, apparently given out as a news item from Washington, D. C., to the effect that the U. S. Entomologist and his assistants, have recently discovered a means of destroying pests in buildings by fumigating with hydrocyanic gas.

"If such an idea is new to the Washington people it is an evidence that Pennsylvania is considerably ahead, as State Zoologist H. A. Surface has been publishing methods of fumigating buildings of various kinds for all insect pests during the past ten years.....the statement from Washington, that the entomologists there have discovered a method of doing such fumigation, appeals to our citizens either as a joke or as an echo from the rear."

We have heard the opinions of some citizens of Pennsylvania on this Bulletin and they appear to be uncertain whether it is a joke, a tragedy, or "an echo from the rear."

The Bulletins of the Division of Zoology of the Pennsylvania Department of Agriculture are copyrighted by Prof. H. A. Surface, Author. Why it is necessary to copyright compilations we can't imagine. Permission to publish extracts is given to all persons who will give proper credit of source. We avail ourselves of this privilege to quote from Bulletin No. 1, Vol. III:

The Bee-louse (*Braula caeca* Nitzsch)....It is a rather large, dark brown, wingless louse-like insect, possessing six legs, and belongs to the entomological order of Diptera or two-winged flies.

The Hog-louse (*Haematopius urinus* Nitzsch).....adults reaching to the length of an inch or more.

The adult carpet beetle is a minute, dark brown, oval insect.

The Book-lice....The adults are small insects with delicate wings and long antennae.

Under the heading "Chewing Insects" is placed the San Jose scale.

This is not the only bulletin in the series that makes interesting reading on account of the copyrighted original material in it.

There is opportunity for great improvement in the scientific output of this department in Pennsylvania, and such work seems to be overshadowed by an undue effort to gain newspaper and other notoriety. We regret to say that the standard of work in Economic Zoology in the great State of Pennsylvania does not compare favorably with what is done in a majority of the other States in the Union.—H. S.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Cystineura amymone (Lepid.).

I note in the June number of the News, page 279, records of the capture of *Cystineura amymone* from several localities in Oklahoma. In October, 1904, a single specimen was taken by me about a mile northwest of Lawrence, Kansas. The specimen seemed chilled and was unable to fly. It was given to the late Dr. F. H. Snow, who stated that it was the first that he had seen taken north of Texas.—C. I. OVERMAN, U. S. S. Supply, Guam, M. I., July 11, 1913.

King George's Interest in Entomology.

We note, with interest, in *The Entomologist*, for July, 1913, that at a recent meeting of the Entomological Society of London it was announced that H. M. the King had been pleased to become a patron of the Society. It is said to be "the first occasion when the Sovereign has demonstrated officially his interest in our branch of science and the work associated with it." We likewise "offer, therefore, our brother entomologists (across the seas), hearty congratulations upon the honor conferred on them."

The Largest Living Insects (Orthoptera).

Dr. Yngve Sjöstedt has recently described a new species of Phasmid, or Walking Stick, from Nyassa, East Africa, as *Palophus titan*, stating that it is the largest winged Orthopter yet known. The only specimen is a female having a body-length of 26.3 cm. (10 5-16 inches) and the hind wing 11.2 cm. (4 3/8 inches) long. The front wing is very much smaller, 3.7 cm. (1 7-16 inches) in length. A life-size colored figure accompanies the description (in *Kungl. Svenska Vetenskapsakademiens Handlingar*, Band 50, No. 6, 1913) and shows the hind wings to be purple, banded and spotted with pale yellow. A table of comparative measurements of other Phasmidæ is given from which it appears that several wingless species exceed *Palophus titan* in body-length, the largest being *Phobaeticus kirbyi* Redt., of Borneo, and *Pharnacia serratipes* Gray, of Pulo-Penang, Malabar and Borneo, in both of which the body is 33 cm. (13 inches) long. These are the largest species of living insects, although the Protodonate *Meganeura monyi* Brongniart, of the Carboniferous of Saint-Etienne, France, had a body 35 cm. (13 3/4 inches) long and a wing-expanse of 64 cm. (25 1/2 inches).

Notice of Public Hearing on the Alligator Pear Weevil (Coleop.).

The Department of Agriculture has information that a dangerous enemy of avocados (alligator pears), known as the avocado weevil (*Heilipus lauri*), exists in Hawaii, Porto Rico, Mexico and other foreign countries. Owing to the rapid increase of avocado culture in this country, and especially in California, there is grave danger of introducing this insect through the importation of seed, which may contain partly developed larvæ of this insect. The avocado weevil lives within the seed of the avocado and so far no thoroughly successful method is known of disinfecting or otherwise treating such seeds so as to kill the insect, without destroying the germinative vitality of the seed. It is hoped, however, that investigations now under way will discover an effective method of treatment under which importation of avocado seed can be permitted. In the meantime it is the duty of the Secretary of Agriculture to consider (in accordance with Sections 7 and 8 of the Plant Quarantine Act of August 20, 1912), the advisability of prohibiting the importation of avocado seeds and avocado fruits from all foreign countries in which this insect is known to occur.

In compliance with the Act, a public hearing will be held at the Department of Agriculture, Washington, D. C., at 10 o'clock on November 18, 1913, at which all persons interested, or their attorneys, may be present and have an opportunity to be heard concerning the establishment of a quarantine against all avocado seeds and avocado fruits coming to the continental United States.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in Heavy-Faced Type refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues of the News, which are generally dated the year previous.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

- 1—Proceedings, Academy of Natural Sciences of Philadelphia.
- 3—The American Naturalist. 4—The Canadian Entomologist.
- 6—Journal, New York Entomological Society. 7—U. S. Department of Agriculture, Bureau of Entomology, Washington. 8—The Entomologist, London. 10—Nature, London. 11—Annals and Magazine of Natural History, London. 13—Comptes Rendus, Societe de Biologie, Paris. 21—The Entomologist's Record, London. 22—Zoologischer Anzeiger, Leipzig. 24—Berliner Entomologische Zeitschrift. 34—Proceedings, Iowa Academy of Sciences, Des Moines. 35—Annales, Societe Entomologique de Belgique. 40—Societas Entomologica, Zurich. 44—Verhandlungen, K. k. zoologisch-botanischen Gesellschaft in Wien. 50—Proceedings of the U. S. National Museum. 68—Science, New York. 74—Naturwissenschaftliche Wochenschrift, Berlin. 78—Gardner's Chronicle, London. 79—La Nature, Paris. 89—Zoologische Jahrbucher, Jena. 92—Zeitschrift fur wissenschaftliche Insektenbiologie. 97—Zeitschrift fur wissenschaftliche Zoologie, Leipzig. 105—Videnskabelige Meddelelser, Naturhistoriske Forening i Kjobenhaven. 119—Archiv fur Naturgeschichte, Berlin. 142—Report, Michigan Academy of Sciences, Lansing. 152—California Agricultural Experiment Station, Berkeley. 153—Bulletin, American Museum of Natural History, New York. 155—Nova Acta Academiae Caesareae Leopoldius Carolinae Germanicae Naturae Curiosorum, Halle. 161—Proceedings, Biological Society of Washington. 166—Internationale Entomologische Zeitschrift, Guben. 182—Revue Russe d'Entomologie, St. Petersburg. 186—Journal of Economic Biology, London. 191—Natur, Munchen. 198—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. 200—Bulletin

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ENTOMOLOGY WITH SPECIAL REFERENCE TO ITS BIOLOGICAL AND ECONOMIC ASPECTS. By JUSTUS WATSON FOLSOM, Sc.D., Assistant Professor of Entomology at the University of Illinois. Second Revised Edition. With four plates and 304 text-figures. Philadelphia: P. Blakiston's Son & Co., 1913. Price \$2.25.

The second revised edition of this well and favorably known book appears as a thinner volume than the first edition. The size of the page remains the same, but the type form is $\frac{5}{8}$ inch longer and $\frac{1}{2}$ inch wider, so that, in spite of much additional matter, although with the omission of one chapter, the number of pages is reduced from vii + 485 to vii + 402. The paper is also a little thinner.

The numbering and titles of the chapters remain as in the first edition as far as Chapter VI and after Chapter X. Chapter VII of the first edition, "Origin of Adaptations and of Species," is omitted in the second. Chapter VIII, of the former, corresponds to No. VII of the latter. Chapter IX of the first, "Insects in Relation to Other Animals," is expanded into Chapters VIII and IX of the second edition, VIII having the same title as the former IX, while the new IX is "Transmission of Diseases by Insects."

Numerous additions to and revisions of the text have been made, as for example on pages 5 (on the new order Protura), 51, 85, 91, 104-5, 105-6, 117, 125, 165, 174, 187, 193, 198, 211, 269, 333, 336, 337, of the new edition, as compared with the corresponding passages of the old.

The interesting colored frontispiece of the first edition, illustrating Protective Mimicry among Butterflies, has gone. Text-figures 167 and

271-3 are new; fig. 205 is reduced from 204 of the first edition; the total number is thus greater by four. Some of these illustrations have suffered sadly in the printing, such as 15 (p. 9), 34 (p. 24), 199 (p. 123).

A few errors of the first edition have been carried over into the second, as the statement (p. 133) that the seventeen-year locust moults about twenty-five or thirty times, in spite of Marlatt's repeated assertion (1898, 1907) that the number is but six, and the use of "exuvia" for "exuviae," on the same page.

Additions have been made to each section of the very useful Bibliography at the end of the book, but the gaps between the dates corresponding to the appearance of the first and second editions, are usually marked and one feels that the author has not been able to observe a uniformity in his selection of titles worthy of inclusion. A noteworthy omission, both in the bibliography and in the text under Geological Distribution and under Interrelations of the Orders, is any reference to the comprehensive work of Handlirsch, *Die Fossile Insekten* (1906-08). Escherich's papers on Termites and especially his useful summary *Die Termiten* (1909) also should have been mentioned.

A notice of the first edition of Prof. Folsom's book was published in the *News* for September, 1906 (vol. xvii, p. 226-3), and we reaffirm what was said there as to its excellence, even though we have been compelled to point out some minor defects in the new.—P. P. C. (*Advertisement*).

FAUNA HAWAIIENSIS, or the Zoology of the Sandwich (Hawaiian) Isles: Being Results of the Explorations instituted by the Joint Committee appointed by The Royal Society of London for Promoting Natural Knowledge and The British Association for the Advancement of Science and carried on with the assistance of those Bodies and of the Trustees of the Bernice Pauahi Bishop Museum at Honolulu. Edited by David Sharp, M.B., M.A., F.R.S., Secretary of the Committee, Cambridge. At the University Press. 4to., Vol. I, Part VI. PREFACE by the EDITOR, INTRODUCTORY ESSAY ON THE FAUNA by R. C. L. PERKINS, pp. I—CCXXVIII, 16 plates, January 15, 1913. (Rec'd at the Acad. Nat. Sci., Phila., July 7, 1913.)

Dr. Perkins began collecting in the Hawaiian Islands early in 1892. Three large volumes, now brought to a conclusion by his Introductory Essay, are chiefly based on the results of his field labors of twenty years and form a noble monument to his industry and interest. As may be seen from the titles of the parts of these volumes, listed below, the insects have come in for by far the major part of his attention. His highly interesting essay has the subtitle, "A Review of the Land Fauna of Hawaii," and occupies 214 pages. It deals with the general fea-

tures of the islands, the general aspect of the flora and fauna, his methods of collecting; the number of species of insects, introduced, immigrant and endemic; causes of extinction, distribution by natural agencies, flightlessness; origin of the fauna and species formation. This general part of the introduction fills 59 pages, the remaining 155 being given to special reviews of the Hymenoptera, Coleoptera, Lepidoptera, Neuroptera, Embiidae, Termitidae, Psocidae, Odonata, Diptera, Hemiptera, Orthoptera, Thysanura, Collembola, Myriopoda, Arachnida, Mollusca and Vermes.

Notwithstanding the time devoted to these explorations, Dr. Perkins emphasizes our very unequal knowledge of the fauna, the Diptera, for example, being much behind the aculeate Hymenoptera. The total number of Hawaiian species of insects known to him "is about 3325, but of these only about 2740 can be considered as belonging to the natural fauna." He thinks "It is possible that half the number of existing species of insects have been collected, but this is by no means certain." These "islands are much richer in species than has been supposed and the scarcity of individuals of species exaggerated." (pp. xxxvii-xli).

The interrelations of the plants and insects are very intimate, as is shown by the fact that the endemic species are chiefly to be found in the true forest belt, which exists at elevations varying from 1200 to 3000 feet and whose two most characteristic members are the Koa (*Acacia koa*) and Ohia (*Metrosiderus*) trees. Much of the forest has been destroyed, largely by cattle, and with it much of the endemic fauna, but it is cheering to know that this loss is now being realized and measures taken to prevent its becoming total (pp. xxvii, xxx).

A very large number of Hawaiian insects have either one or both pairs of wings functionless for flight, or entirely wanting. Examples are known among the Lepidoptera, Diptera, Hymenoptera, Hemiptera, Neuroptera, Orthoptera and Coleoptera. Dr. Perkins believes that all these are "to be explained simply by 'disuse'" (pp. xlviii-lii).

His view of the present Hawaiian fauna is that it "cannot be said to belong to any of the great faunistic regions of the globe; it contains most important elements derived from the Oriental region, from the Australian and from the Neotropical or at least from the warmer parts of America, and it cannot be considered as even belonging chiefly to any one of these regions. On present information it is decidedly not Polynesian" (p. lxx). It "is derived from waifs and strays from all directions. At rare intervals from the Eocene till now chance immigrants have arrived. Some have been able to establish themselves, many more probably, even after a landing has been effected, have failed. Those that have been successful and have found congenial conditions have often thriven amazingly, giving rise to hosts of descendant species, as they have become adapted to, or become modified by, diverse conditions" (p. lx). Illustrations are the chalcid *Eupel-*

mus, 54 species, (pp. lxxvi, lxxviii), the Cerambycids *Clytarlus*, 14 spp., and *Plagithmysus*, 33 spp., the latter often mistaken by non-entomologists for crickets or grasshoppers (pp. cxvi-cxix), the Selidosemid moth *Scotorythra*, 34 spp., and its allies (p. cl), the Hemerobiid *Nesomicromus*, 22 spp., the Chrysopid *Anomalochrysa*, 29 spp., and the peculiar Odonata referred to *Agrion*, 26 spp., (p. clxxi). A fuller list is given on p. lii.

Although our author remarks: "The absence of gaily colored native butterflies or diurnal moths prevents the insects from making any conspicuous showing. It is doubtful whether to ordinary observers there is, excepting the fine *Pyrameis tammeamea*, a single insect that would be considered beautiful" (p. xxxi), the Hawaiian insects, nevertheless, present some interesting color-phenomena. Thus, the "general tendency to blackness of the Hawaiian Aculeata as a whole is one of their most remarkable features." The wasps of the genus *Odynerus* (s. l.), however, show many instances of conspicuous red or yellow markings. If they be divided up into a number of color groups, "these are entirely different from groups based on structure and real affinity. . . these color groups occur on each island and some of them, indeed, are only found on one of the islands" (p. xciii). Although this instance is similar to those commonly referred to mimicry, Dr. Perkins thinks that neither this nor any other explanation yet suggested is satisfactory.

Species of the moth *Scotorythra* mentioned above are sometimes present in immense numbers and their larvae, by defoliating the trees, suffer from famine. "Native birds attracted in thousands by the abundance of [the larvae], one of their favorite foods, were gorged to repletion, and the starving caterpillars formed writhing masses on the ground beneath the tall Koa trees. The dropping of excrement from the trees on the dead leaves beneath made a rattling noise as of a hailstorm" (p. cli).

"*Stegomyia fasciata* and *scutellaris* are well-known to all inhabitants as the 'day-mosquito'" and a case of yellow fever has been reported (p. clxxxi). The Sarcophagids *Dyscritomyia*, and *Prosthetochaeta* pass their larval stages in dead land Mollusca such as the famous *Achatinellas* (p. clxxxvi). There are no endemic Muscidae, but a number of foreign representatives (p. clxxxvii).

The majority of the Orthoptera are introduced, most of the native species being crickets, one of which (*Paratrigonidium*) is responsible for the song credited by the natives to *Achatinella* (p. ccxxv). The endemicity of the spiders is greater than that known in any other country (ccxi).

These scattered extracts will give some idea of the many interesting topics touched on and discussed in Dr. Perkins' Essay. The accompanying plates contain likenesses of Chas. R. Bishop, W. H. Flower,

Alfred Newton and F. D. Godman, associated with this work, relief maps of six of the Hawaiian islands, four landscapes and four colored plates of birds of the genus *Oreomys*, of Orthoptera, Coleoptera and Hymenoptera discussed in the Introduction. Following is the list of contents of the whole work:

Vol. I. Part I. Hymenoptera Aculeata.—By R. C. L. Perkins and Auguste Forel, pp. 1-122, 2 pls., map. March 20, 1899. Part II. Macrolepidoptera.—By E. Meyrick, pp. 123-275, 5 pls. June 8, 1899. Part III. Hymenoptera Parasitica.—By W. H. Ashmead, pp. 277-364, 2 pls. August 1, 1901. Part IV. Vertebrata.—By R. C. L. Perkins, pp. 365-466. November 19, 1903. Part V. Microlepidoptera.—By Lord Walsingham, pp. 469-759, 16 pls. December 1, 1907.

Vol. II. Part I. Orthoptera.—By R. C. L. Perkins, pp. 1-30, 2 pls. August 19, 1899. Neuroptera.—By the same, pp. 31-89, 3 pls. September 25, 1899. Part III. Coleoptera I.—By D. Sharp and R. C. L. Perkins, pp. 91-270, 5 pls. February 8, 1900. Part IV. Mollusca.—By E. R. Sykes; Earthworms by F. E. Beddard; Entozoa by A. E. Shipley, pp. 271-441, 4 pls. May 19, 1900. Part V. Arachnida by E. Simon, Crustacea Isopoda by A. Dollfus, Crustacea Amphipoda by T. R. R. Stebbing, pp. 443-530, 7 pls. October 17, 1900. Part VI. Supplement to Hemiptera.—By G. W. Kirkaldy, to Hymenoptera, Orthoptera, Neuroptera and Diptera by R. C. L. Perkins, pp. 531-700. December 17, 1910.

Vol. III. Part I. Diptera.—By P. H. Grimshaw, pp. 1-77, 3 pls. December 30, 1901. Part II. Diptera (supplement) by the same and P. Speiser; Hemiptera by G. W. Kirkaldy, pp. 79-174, 2 pls. December 23, 1902. Part III. Coleoptera II.—By D. Sharp, pp. 175-202, 2 pls. April 9, 1903. Part IV. Thysanura and Myriopoda.—By F. Silvestri; Collembola by G. H. Carpenter, Mallophaga by V. L. Kellogg and B. L. Chapman; Arachnida (supplement) by E. Simon; Macrolepidoptera (supplement) by E. Meyrick, pp. 293-366, 5 pls. April 9, 1904. Part V. Coleoptera III.—By D. Sharp and H. Scott, pp. 367-579, 4 pls. December 18, 1908. Part VI. Coleoptera IV.—By R. C. L. Perkins, H. Scott and D. Sharp, Strepsiptera by R. C. L. Perkins; Thysanoptera by R. S. Bagnall; Acarina by N. D. F. Pearce, pp. 581-704, 3 pls. December 17, 1910.—P. P. C.

Doings of Societies.

FELDMAN COLLECTING SOCIAL.

Meeting of May 21st, 1913, at 1523 South Thirteenth Street, Philadelphia. Eleven members were present, President Haimbach in the chair.

Mr. Wenzel, Jr., said that on several trips to the Philadelphia Neck last fall all the *Cecropia* cocoons observed were

gathered. From these within the last month he had reared many parasites which include Diptera (*Tachina*) and several species of Hymenoptera; one species of the latter was hyperparasitized. The chrysalids of a species of moth had been found between the cocoons proper and the outer covering. These had also emerged and were identified by Mr. Haimbach as *Phlyctaenia tertialis* Guen.

Mr. Daecke exhibited his collection of Tortricidæ, which included Pennsylvania specimens of *Rhyacionia wenzeli* Kearf.

Mr. Wenzel exhibited a specimen of the beautiful *Carabus vietinghovi* Adams, from Alaska. Said he had been to Malaga, N. J., May 5, and had taken the usual spring forms, also five specimens of *Buprestis ultramarina* Say.

Mr. George M. Greene exhibited a specimen of the weevil, *Peritaxia hispida* Horn, from Cisco, Eastland County, Texas, September 21, '12 (altitude 1450-1550 feet), from the Rehn and Hebard material. This was fastened to a blade of grass by a silken band about the middle of the body, presumably by a spider. The back of the insect was towards the grass.

Dr. Castle said he had been to Pine Beach, New Jersey, but the weather was so cold that collecting was poor.

Mr. Kaeber said that *Lachnosterna* had been attracted to light in great numbers the evening of May 17th.

A paper was read from the April number of *Outdoor World and Recreation* on "The winter home of the Monarch Butterfly," by Lucia Shepardson. This was a very interesting account of the migration of this species, *Anosia plexippus*.

Adjourned to the annex.

Meeting of June 18, 1913, at 1523 South Thirteenth Street, Philadelphia. Eleven members were present, three visitors. President Haimbach in the chair.

Mr. Daecke exhibited a box of miscellaneous material collected by himself at Rockville, Pa., June 1, 1913, including 124 specimens of 75 species. He recorded a southern species of Lepidoptera, *Thecla m-album* Bd.-LeC., from Rockville, Pa., April 24, 1913.

Mr. George M. Greene exhibited two specimens of *Gnorimus maculosus* Knoch (Col.) from Overbrook, Pa., June 1, 1913, and June 15, 1913. These were taken accidentally (as all specimens of this species seem to be), one on a rail fence and the other on a cement walk. The only other specimen he had taken was on a doorstep, Philadelphia, May 8, 1894. Specimens of *Arotes amoenus* Cress. and *Ibalia maculipennis* Hald. (Hym.) were also shown. These were common on dead oak and beech, June 1 and June 15, 1913, in Overbrook woods. A specimen of *Calosoma frigidum* Kirby (Col.), Boonton, N. J., May 30, 1901, was also exhibited, all collected by himself.

Mr. Haimbach exhibited a box of moths which he had collected at night on his "farm" at Upper Roxborough. There were 305 specimens, of which 75 were taken in one night. These included the following which were specially pointed out to the members: *Acronycta*, 2 sp.; *Mamestra lorea* Guen., *Xylina laticinerea* Grt., *Erastria concinna macula* Guen. and var. *parvimaculata* Grt., *Nerice bidentata* Walk., *Hydriomena multiferata* Walk., *Anaploides iridaria* Guen., *Eriippe prunifoliella* Cham., *Tmetocera ocellana* Sch. and *Depressaria* sp.

Mr. Wenzel exhibited and recorded three species of *Lina* (Col.) which he said were very common on willow at Castle Rock, Pa., June 8; *L. tremulae* Fabr., *L. scripta* Fabr. and *L. lapponica* Linn.; the former was never recorded from this vicinity except as accidental. Other Coleoptera from the same locality and date were: *Anthaxia viridifrons* Lap., *Saperda imitans* Joutel, *S. discoidea* Fabr., *S. lateralis* Fabr. and *S. concolor* Le C. (the workings in willow of the latter were also shown). *Helluomorpha nigripennis* Dej., Malaga, N. J., May 25 (2 specimens) and *Helops gracilis* Bland, Da Costa, N. J., May 30.

Mr. Kaeber exhibited a specimen of *Cychnus viduus* Dej. (Col.) which he had collected at Castle Rock, Pa., June 1, 1913; *Gnorimus maculosus* Knoch, Media, Pa. May 24, *Cryptorhynchus parochus* Hbst., Media, May 24 (on oak), *Acanthoderus decipiens* Hald., South Philadelphia, June 15 (on

oak), *Xylotrechus colonus* Fabr., South Philadelphia, June 15 (on oak), *Elaphidion parallelum* Newm., South Philadelphia, June 15 (on oak) and *Bolboceras farctus* Fabr., Castle Rock, Pa., June 1, 1913. Also a specimen of Diptera: *Oncodes costatus* Loew, Castle Rock, Pa., June 1, 1913.

Adjourned to the annex.

GEORGE M. GREENE, *Secretary*.

AMERICAN ENTOMOLOGICAL SOCIETY.

Meeting of April 24, 1913. Dr. Philip P. Calvert, president, in the chair; seven persons were present.

Mr. Rehn made some remarks on the genus *Dichopetala* and exhibited the known species. The anatomical features of the species were pointed out in conjunction with their specific characters. They all live in thorny or tangled thickets. There are fourteen species, of which three were previously known and eleven are new. Of the old species, two types are in Vienna and one in Cambridge, Mass. Of the new forms, seven types are in Philadelphia, three in Cambridge and one in the American Museum of Natural History in New York. Of three of the new forms the only material was taken by Rehn and Hebard in 1912 and also a large series of three others. Seven species are Mexican only, five from the United States only and two from Mexico and the United States.

Dr. Calvert discussed the terms nymph, larva and pupa and considered their possible differentiation and limitations.

Mr. Williams exhibited some very interesting drawings of various European and exotic insects, purchased from a book dealer in London. They were the work of Petiver and others and dated from about 1809.

Mr. Laurent referred to an article on *Anosia plexippus* published in *The Outdoor World* for April, in relation to its habits of assembling and migrating and settling on pine trees at Pacific Grove, Cal. Mr. Rehn said the Monterey Peninsula was quite cold and that there are many warmer places in California, and why these butterflies select the place men-

tioned does not seem clear. Dr. Calvert suggested that a series of observations on these migrations should be made in the same way that the birds are studied.

Meeting of June 9, 1913. Dr. Philip P. Calvert, president, in the chair; eight persons were present.

Mr. Laurent said he had raised *Paratenodera sinensis* to see how many nymphs would be produced from each egg-mass. They produced as follows: 150 from the smallest and 300 from the largest. Each mass was kept in a separate box.

Mr. A. N. Caudell, of Washington, D. C., said *Stagmomantis carolina* varied greatly in abundance in the vicinity of Washington in different years. During some years it was quite difficult to find any specimens of this species. He referred to a small collection of Orthoptera made in north Peru, east of the Andes, and nearly all proved to be new. Another collection from just over the divide did not show nearly as many new forms. This shows a marked geographical barrier.

He also spoke of his method of keeping types in Riker mounts and explained its utility, and said the safety of the type preserved in this way appealed to him. Mr. Rehn said the thing one wished to see in a Riker mount was usually covered up. He also objected to cotton in contact with a dry specimen.

Mr. Rehn made some remarks on the geographical distribution of the genus *Arethaea*, nine species of which are found in the arid and semi-arid region of Texas. There is an isolated form found in Florida. He spoke of the comparative anatomy of the genus in relation to their systematic differentiation. The group characters were also explained.

Mr. E. T. Cresson, Jr., stated that Mr. E. G. Vanatta had reared *Scenopinus glabrifrons* from the Mediterranean Flour Moth, *Ephestia kuehniella*.

Dr. Calvert exhibited a female specimen of *Tetragoneuria* (Odonata) arrested in transformation, which he had found on a wooden post on the bank of the Rancocas Creek, above Mt. Holly, N. J., June 3, 1913. The wings of the right side were still partly within the wing-pads of the exuvia and so held the imago fast; the wings of the left side were free but not completely expanded. When found, the insect was able to move its legs and the left wings; the head, thorax and abdomen were well formed and well colored. Four ants, however, were engaged in feeding on the abdomen, so that only the first five segments were intact, the others being more or less destroyed. The ants were secured and had been com-

pared by the speaker with specimens in the Academy's collection determined by Professor Wheeler; they appeared to be *Formica schaufussi* Mayr. var. *incerta* Emery. Cases where Odonata have survived for some time the loss of terminal abdominal segments have been previously recorded, as for example, by the speaker in the *Transactions* of this Society, Vol. xx, p. 193. The present observation is also of interest in recalling another source of danger to which these insects are exposed at the critical period of metamorphosis.

Dr. Calvert also exhibited about two hundred Coleoptera which he had incidentally picked up in Costa Rica.

HENRY SKINNER, *Secretary*.

OBITUARY.

HERBERT DRUCE.

The death of Mr. Herbert Druce was announced at the May (1913) meeting of the Entomological Society of London. He was born July 14, 1846, and is chiefly known as the author of the section *Lepidoptera Heterocera* (excluding the micros) of the *Biologia Centrali-Americana*, two volumes of text and one of plates, published 1881-1900, enumerating 3,639 species. Brief obituary notices appeared in *The Entomologist* for June, 1913, and *The Entomologist's Record* for June 15. The disposition of his collections was mentioned in the *News* for October, page 374.

DR. AUGUSTE PUTON.

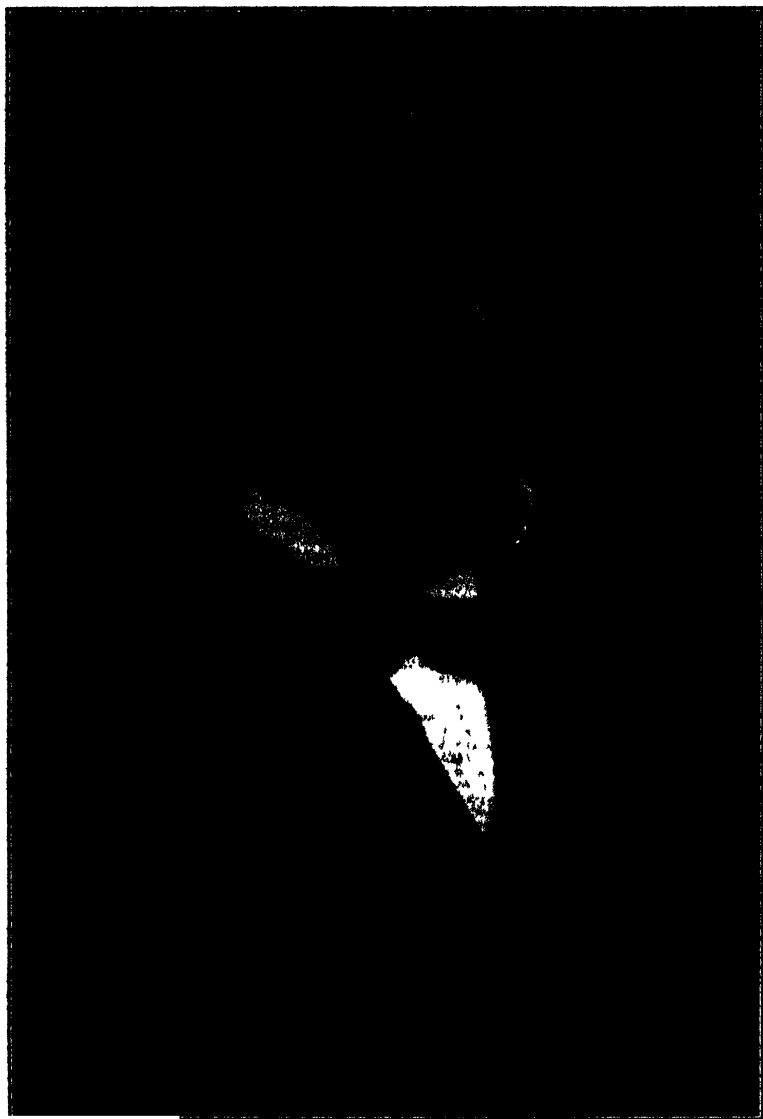
Dr. Auguste Puton, author of works on the Hemiptera, member of the Entomological Society of France since 1856 and the dean of its honorary members, died at Remiremont April 8, 1913. (*Bull. Soc. Ent. France*, 1913, No. 8.)

PROF. FRITZ WACHTL.

Fritz Wachtl, one of the five founders of the *Wiener Entomologische Zeitung* and for nineteen years an editor thereof, died March 4, 1913. Born in Breittau, Moravia, July 18, 1840, he entered the forestry service and became Professor of Forest Conservation and Forest Entomology in the Agricultural High School in Vienna in 1895. His entomological publications, which are listed in a biographical notice in the *Zeitung* for July 15, 1913, (xxxii, 7-9), dealt largely with forest insects.

DR. PAOLO MAGRETTI.

The death of this Hymenopterist at Cascina Amata di Paderno Dugnano, Italy, on August 30, 1913, is announced.



DR. PHILIP REESE UHLER.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXIV.

DECEMBER, 1913.

No. 10.

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Philip Reese Uhler, LL.D.

(Portrait, Plate XV, from a photograph taken November 17, 1911.)

These men of the old school were lovers of nature. They knew nature, as a whole, rather than as a fragment or a succession of frag-ments. They were not made in Germany or anywhere else, and their work was done because they loved it, because the impulse within would not let them do otherwise than work, and their training, partly their own, partly responsible to their source of inspiration, was made to fit their own purposes. If these men went to Germany, as many of them did, it was for inspiration, not for direction; not to sit through lectures, not to dig in some far-off corner of knowledge, not to stand through a doctor's examination in a dress coat with a major and two minors, not to be encouraged *magna cum laude* to undertake a scien-tific career. The career was fixed by heredity and early environment. Nothing could head them off and they took orders from no one as to what they should do, or what they should reach as conclusions. They did not work for a career—many of them found none—but for the

love of work. They were filled with a rampant exuberant individuality which took them wherever they pleased to go. They followed no set fashions in biology. Such methods as they had were their own, wrought out by their own strength. They were dependent upon neither libraries nor equipment, though they struggled for both. Not facilities for work, but endeavor to work, if need be without facilities, gave them strength, and their strength was as the strength of ten.

These words of Dr. David Starr Jordan apply well to the American naturalists of the period when there was actively at work in this country what has been termed the second generation of distinguished American entomologists. This group consisted of Le Conte, Horn, Packard, Scudder, Cresson, Uhler and Grote. Le Conte was the oldest of the group; was born in 1825, living and working for 58 years. Uhler, born ten years later than Le Conte, lived to be 78 years of age. Scudder, born two years later than Uhler, died at the age of 74. Cresson, born a year later than Scudder, is the only survivor of the group and has now reached the age of 75. Packard, born the year after Cresson, lived for 66 years. Horn, born still a year later, lived for 57 years; and Grote, still a year later, died at the age of 62. Think what the work of this group of men did for North American entomology!

Philip Reese Uhler, who passed away at his home in Baltimore, October 21st, 1913, was a man of great culture and charm, an indefatigable worker, and a typical naturalist at the period of his ripe manhood. He was born in Baltimore, June 3, 1835. He was son of George Washington Uhler, a well-to-do and philanthropic merchant of that city, and of Anna Maria (Reese) Uhler. His great grandfather, Erasmus Uhler, came to America from England and served as a private in the Revolutionary army; and his maternal great grandfather was a Captain on the American side in the war of the Revolution. In the second war with England, his paternal and maternal grandfathers were both actively engaged in the battle of North Point, in which the latter, Captain John Reese, was wounded.

Doctor Uhler received his early education at Baltimore College and at the latin school of Daniel Jones. He was interested in natural history as a boy, and began to collect at an

early age. When he was ten years old his father bought a farm near Reisterstown, and it was here that he acquired his fondness for the study of insect life. His interest in insects was discovered and encouraged by J. F. Wild, a German entomologist, and by the Rev. John G. Morris, pastor of the First English Lutheran Church, which Doctor Uhler's grandfather helped to found. In 1863, at the age of twenty-eight years, he was appointed Assistant Librarian of the Peabody Library, and early in 1864 went to Cambridge at the call of Louis Agassiz. He was paid for his services as assistant to Professor Agassiz and as Librarian in the Museum of Comparative Zoology, and taught entomology to some of the undergraduates. He also gave a series of lectures on entomology in the lecture room of the M. C. Z. He was also at the same time a regularly entered student in the Lawrence Scientific School of Harvard University, attending Louis Agassiz's lectures in zoology and geology from the spring of 1864 to the end of the first term in 1867. He attended also lectures by Asa Gray, Jeffries Wyman, Alexander Agassiz, and N. S. Shaler. At the end of the first term, in 1867, he was called away from Cambridge rather suddenly, when Professor Louis Agassiz was in a very helpless condition and unable to give Uhler the degree of Bachelor of Science, which he was entirely qualified to receive. The degree, however, was later given to him by the University. Among his papers is a most appreciative note received from Dr. Oliver Wendell Holmes just before he retired from the work at Harvard.

Before he went to Harvard, Uhler had become a member of the Academy of Natural Sciences of Philadelphia (1858), and of the Entomological Society of Philadelphia (1859). He had published a number of systematic papers on Coleoptera, Neuroptera, and Hemiptera, and had translated for the Smithsonian Institution and edited (with the assistance of Osten Sacken) Hagen's elaborate Synopsis of the Neuroptera of North America, published by the Smithsonian in 1861. It was this early work which attracted the attention of the elder Agassiz.

While at Cambridge, Uhler met among others Albert S. Bickmore, and together they discussed plans for the founding of a great natural history museum in New York City. Writing to Uhler May 7, 1867, from Japan, Bickmore says, "I have by no means forgotten our favorite hopes to see a great museum erected in New York, and have been doing all I could in this distant quarter to forward our plans."

After leaving Harvard Uhler returned to Baltimore to become Assistant Librarian of the Peabody Library, and in 1870 was made Librarian, and there he spent the rest of his life. Mrs. Uhler considers that his great work is the catalog of the Library, which is indeed a model. While his main work was in the Peabody Institute, he continued practically all his life his entomological investigations, and interested himself in many other matters. He was a student of geology and wrote several important geological papers. He gave much help at the time of the forming of the Johns Hopkins University, and was the first associate professor appointed in the University, and in this capacity was connected with the institution until the time of his death. His life was the quiet and uneventful one of a student; his profound modesty kept him in the background, and he disliked what he termed "cheap notoriety." Like nearly all great naturalists, he was a most helpful man; no worker appealed to him in vain, and to many he was of the greatest help. He was broadly read, and possessed an astonishing memory. Mrs. Uhler tells me that in the summer of 1893 he went abroad and purchased for the Peabody Library about twenty thousand dollars' worth of books. They were bought without the aid of lists, since he trusted to his memory of the books already in the library, and when the accessions were finally catalogued it was found that he had bought but three duplicates of those previously possessed.

Doctor Uhler was married in 1867 to Miss Sophia Werdebaugh, who died in 1884. One son came from this marriage—Horace Scudder Uhler, who is now Professor of Physics at Yale. In 1886 he married Miss Pearl Daniels, of Baltimore, who was a true helpmeet to him and who survives. Of this

marriage there was one daughter, Miss Miriam D. Uhler, now a student at Goucher College in Baltimore.

Uhler's publishing career began in 1855, and his first paper was published in the *Proceedings of the Academy of Natural Sciences of Philadelphia* under the title "Descriptions of a Few Species of Coleoptera supposed to be New." His next paper (1857), also published in the *Proceedings* of the Academy, was entitled "A Contribution to the Neuropterology of the United States," and this was followed the next year by another paper on Neuroptera. His first publication on the Hemiptera was published in 1860, and was a report on the Hemiptera of the North Pacific Exploring Expedition, also published in the *Proceedings* of the Academy. From that time on his entomological papers related almost entirely to the Hemiptera, and of these there was a careful list published by Samuel Henshaw in *Psyche*, Volume X, 1903. There is a long list of papers relating to collections made in the surveys of the western territories, and it was the habit of collectors and institutions for many years to send all of their Hemiptera to him for study and report. He described many new forms, and had a broad comprehensive view of the whole heterogeneous group. How firm a grasp he had of the whole subject is well shown by his admirable chapter on Hemiptera (a book in itself) in the *Standard Natural History*. His last entomological paper was published in 1904, thus rounding out the unusually long period of fifty years of active publishing life.

As would naturally follow from a life of such activity in systematic entomology, he built up a large and valuable collection. His arduous work with his frequently very minute specimens had an injurious effect upon his eyes, and in 1886 an operation was performed which restored his sight, and he worked on for the most part unhampered by poor eyes until 1905, when his sight began to fail gradually from glaucoma. He felt that this failure was irreparable and reconciled himself to the prospect of blindness. He had during all these years constantly in mind the preparation of a large monograph of the Capsidae, the manuscript of which the writer saw on

one of his first visits to Uhler, probably in 1880. It was already at that early date a very large manuscript book, but it has never been published, owing to his desire to make it as nearly perfect as possible. When he became sure that his eyes had finally failed, he consulted with Mr. O. Heidemann, of the Bureau of Entomology at Washington, concerning the possible completion of the work by Mr. Heidemann, but no definite arrangements were ever made. In 1907 he finally decided to part with his collections, and presented the Meyer-Dür collection of European Hemiptera to the Museum of Comparative Zoology at Cambridge. The rest of his collection, including all of the North American Hemiptera, was presented to the U. S. National Museum, and was gradually brought to Washington in installments by Mr. Heidemann and Mr. H. S. Barber. It is now a part of the National Museum collection.

At one time Doctor Uhler was officially known as the Entomologist of the Hayden Survey, and while Assistant Librarian of the Peabody Library he was given leave of absence to accompany a survey party on an expedition to Colorado. In Baltimore he was at an early date energetic in his endeavors to encourage the study of natural science in the public schools of Maryland, and delivered addresses on scientific subjects throughout the State. He always took the keenest interest in the Maryland Academy of Sciences, of which he was Curator, Secretary, Vice-President and later President. In 1900 he was given the honorary degree of LL.D. from New York University, and in 1912 he was made an honorary member of the International Congress of Entomology at Oxford.

Doctor Uhler was one of the founders of the Entomological Society of Washington, and used from time to time to come to Washington for the evening meetings of the Society, always having some interesting topic to present. He was a fluent and delightful speaker with a charming personality, and inspired interest in the most technical subject by his lucid method of presentation. On several occasions also he entertained the Society at his home in Baltimore, so that Washington entomologists had the great privilege of personal friend-

ship with this veteran naturalist denied by distance to most of the third and fourth generations.

I greatly regret that space will not permit me to present a fuller account of Doctor Uhler's useful and beautiful life. Mrs. Uhler tells me that he left a mass of manuscripts and correspondence, and it is greatly to be hoped that a lengthy account of his career may be published. The world does not seem to be making this type of man nowadays, and it is a pity.

L. O. HOWARD.

The Neotropical *Tipulidae* in the Hungarian National Museum (Diptera).—II.

By CHARLES P. ALEXANDER, Ithaca, N. Y.*

(Plate XVI.)

Tribe 2—ANTOCHINI.

Genus **Teucholabis** Osten Sacken.

1859. *Teucholabis* Osten Sacken; Proc. Acad. Nat. Sci. Phila.; p. 223.

Teucholabis is the dominant Antochine genus in the tropics of the New World. Many species were included in the collection and are considered in the following pages.

Teucholabis flavithorax Wiedemann.

Two specimens, ♂ ♀, from Callanga, Peru.

Teucholabis tristis, sp. n. (Pl. XVI, Fig. 1).

Head and thorax shining black; wings infused with brown; *Rs* long, only slightly arcuated.

Female.—Length, 5.6 mm.; wing, 6 mm.

Rostrum and palpi dark brown; antennæ dark brownish black; front, vertex and occiput dark shining black.

Thoracic dorsum shining black, the pronotum dull yellowish, this color continued caudad as a narrow stripe along the lateral margin of the præscutum to the wing root; pleuræ black. Halteres brown, knob yellow.

Legs, coxæ and trochanters brown, femora yellowish brown, the tip

*Contribution from the Entomological Laboratory, Cornell University.

broadly dark brown; tibiae and tarsi dark brown; the brown femoral apices are broadest on the fore femora, narrower on the hind femora.

Wings with a light brown suffusion, a little more hyaline in cells 1st *R*1, tip of cell *R* and in cell 1st *M*2; stigma dark brown, oval. Venation (see Plate xvi, fig. 1): *R*s long, almost straight; cell 1st *M*2 short; basal deflection of *Cu*1 at the fork of *M*.

Abdomen moderately long, dark brownish black.

Holotype, ♀, Callanga, Peru, in the Hungarian National Museum.

***Teucholabis fulgens*, sp. n. (Pl. XVI, Fig. 2).**

Head reddish; pronotum yellow; mesonotal præscutum reddish yellow with three dark spots; posterior coxæ similar in color to the other coxæ; wings hyaline with no dark brown basal spot, tip infuscated.

Female.—Length, 5 mm.; wing, 5.8 mm.

Rostrum and palpi brown; antennæ brown; front, vertex and occiput reddish.

Pronotum yellow. Mesonotal præscutum rich orange yellow, a small rounded, dark brown median spot near the cephalic margin; an oblong transverse mark of the same color on the caudal region of the præscutum; scutum yellow, the lobes more orange; scutellum light yellow; postnotum reddish orange. Pleuræ reddish orange, a rounded black spot midway between the root of the wings and the base of the halteres. Halteres brown, the knob orange yellow.

Legs, coxæ and trochanters reddish yellow, fore femora with the basal fifth yellow, remainder brownish black, tibiae and tarsi brownish black, middle and hind femora yellow with the tip broadly dark brown, tibiae dark brown, lightest medially, tarsi dark brownish black.

Wings subhyaline, tip slightly infuscated; a triangular brown stigma and a very narrow brown seam on the cord down to cell 1st *M*2. Venation (see Plate xvi, fig. 2): *R*s rather strongly arcuated, its origin slightly anterior to *Sc*2.

Abdomen with the six basal tergites dark brown, apical tergites and the valves of the ovipositor rich reddish yellow; sternites light reddish yellow.

Holotype, ♀, Callanga, Peru, in the Hungarian National Museum.

***Teucholabis jocosa*, sp. n. (Pl. XVI, Fig. 3).**

Head grey; pronotum inconspicuous, yellow; mesonotal præscutum reddish yellow with three dark spots; all coxæ reddish; wings hyaline with a pale brown rounded stigma.

Female.—Length, 5.2 mm.; wing, 5 mm.

Rostrum and palpi dark brownish black; antennæ dark brownish black; front, vertex and occiput grey.

Pronotum not conspicuous, dull yellow; præscutum orange medially, lighter colored, yellowish, on the sides, a brown median stripe broadest in front near the cephalic margin of the sclerite, becoming indistinct behind at about midlength of the sclerite, a rounded brownish black spot on the sides of the præscutum near the suture; scutum, scutellum and postnotum dull brownish yellow, not brightly colored. Pleuræ dull yellow. Halteres pale yellowish brown, knob and stem almost unicolorous.

Legs, coxæ and trochanters dull yellow, femora dull yellow, the tips broadly dark brown, tibiæ yellowish brown, the tips broadly darker brown, tarsi dark brown; the brown femoral and tibial apices are subequal in length on all the legs.

Wings hyaline, with a pale brown rounded stigma. Venation (see Plate xvi, fig. 3): *Rs* long and almost straight.

Abdomen dark brownish black, the extreme apices of segments 1 to 6 indistinctly dull yellow; apical segments dull yellow, the base of the 7th tergite blackish.

Holotype, ♀, Coroico, Bolivia, in the Hungarian National Museum.

Teucholabis jucunda, sp. n. (Pl. XVI, Fig. 4).

Head black; pronotum light yellow; mesonotum light yellow with dark brown spots; pleuræ with a large blotch; hind legs blackish; halteres dark throughout; wings brown with two large enclosed subhyaline blotches.

Female.—Length, 6 mm.; wing, 8.3 mm.

Rostrum and palpi black, the former elongated; antennæ dark brownish black; front, vertex and occiput black.

Pronotum elongate, conspicuous, light yellow. Mesonotal præscutum light reddish yellow or orange yellow, a shining brownish black triangular spot on the middle of the sclerite, its anterior end broadest, its apex directed caudad and becoming much paler behind, spreading out over this part of the sclerite, a large rounded dark brown spot on the sides of the sclerite behind; scutum, lobes dark brownish black, median line and margins of the sclerite reddish yellow; scutellum and postnotum yellowish. Pleuræ light dull yellow with a very large conspicuous brownish black mark on the mesopleuræ. Halteres brownish black throughout.

Legs, fore coxæ and trochanters yellowish, rest of fore legs missing; middle coxæ and trochanters brown, base of the femora yellowish brown soon passing into the dark brown of the tip, tibiæ and tarsi dark brown; hind coxæ and trochanters black, femora, tibiæ and tarsi dark brownish black.

Wings hyaline or subhyaline, with conspicuous brown markings on the tip, along the cord and sub-basal, so that of the ground color only the following remains: A large blotch distad of the cord extending from cell 2nd *R*₁ caudad into cell *Cu*₁ including most of cell 1st *M*₂; the median blotch is irregular, embracing the middle of cells *R*, *M*, and *Cu* and the tips of the anal cells; the anal angle of the wing is pale. Venation (see Plate xvi, fig. 4): *Sc* long, *Sc*₁ ending nearer to the fork of *R*₅ than to its origin.

Abdomen with three basal tergites dark brown, the remaining similar in color with broad pale yellowish brown apices; sternites dark brownish black with very broad yellowish apices to the sclerites except the apical segments which are uniformly dark; ovipositor, base blackish, tip yellowish.

Holotype, ♀, Callanga, Peru, in the Hungarian National Museum.

In my key to *Teucholabis* (Psyche, vol. 20, No. 1, pp. 43, 44, 1913) *jucunda* would run down to *pulchella* Alexander, from Eastern Brazil. From this species it differs in the increase in brown markings on the thorax and the much darker wing pattern. It is much more closely related to *T. laeta* described below.

***Teucholabis laeta*, sp. n. (Pl. XVI, Fig. 5).**

Head reddish brown; pronotum yellow; mesonotum reddish yellow with dark brown spots; pleuræ uniform; halteres dark throughout; wings with broad dark brown fasciæ, basal cells almost clear of dark color.

Male.—Length, about 4.1 mm.; wing, 5.3 mm.

Rostrum, palpi and antennæ dark brownish black. Front, vertex and occiput very deep reddish brown.

Pronotum yellow. Mesonotal præscutum rich reddish yellow with a large oval, median, dark brown blotch on the anterior portion of the sclerite, larger more rounded spots of the same color on the sides of the sclerite behind; scutum reddish, the lateral cephalic edge of the lobes with a brown blotch; scutellum and postnotum reddish yellow. Pleuræ uniform reddish yellow without black markings. Halteres uniformly dark color.

Legs, coxæ and trochanters dull yellow, fore femora with the basal third yellowish passing into dark brown, tibiæ base and tip dark, the intermediate portion somewhat lighter, yellowish; remaining femora with the dark tip narrower.

Wings subhyaline with the tip dark brown, a broad seam of the same

dark color along the cord, these two bands cutting off a large oval blotch of the ground color, base of the wing almost free from brown markings, except at the tips of the anal veins. Venation (see Plate xvi, fig. 5): *Sc* long, origin of *Rs* far before its tip.

Abdomen with the tergites dark shiny black, the fifth much paler, yellowish, basally and apically; sternites reddish yellow, uniform.

Holotype, ♂, Songo, Bolivia, in the Hungarian National Museum.

Closely allied to *jucunda* but much smaller, the thoracic coloration especially in the pleuræ different and wing-pattern and venational details quite distinct. It should be noted that in the genus *Teucholabis*, the males are invariably larger than the females, a condition that is quite different from what occurs in most crane flies.

***Teucholabis hilaris*, sp. n. (Pl. XVI, Fig. 6).**

Head reddish; pronotum yellow; mesonotal præscutum yellow with three broad brown stripes confluent behind; scutellum yellow; posterior coxæ dark; wings hyaline with the tip infuscated.

Male.—Length, 5 mm.; wing, 5.5 mm. *Female*.—Length, 4 mm.; wing, 4.8-5 mm.

Rostrum and palpi brownish yellow; antennæ basal segment orange yellow, flagellum black; front, vertex and occiput orange yellow.

Pronotum conspicuous, rich orange yellow, very shiny. Mesonotal præscutum yellow with three very broad dark brown stripes which almost conceal the ground color, these stripes confluent behind near the transverse suture; scutum yellow, each lobe with a large dark brown rounded spot in the center; scutellum light yellow; postnotum brownish black. Pleuræ, propleuræ yellow; meso- and metapleuræ dark shining black. Halteres, stem brown, knob bright orange yellow.

Legs, fore and middle coxæ and trochanters light orange yellow, fore femora yellowish on basal fourth, remainder dark brown, tibiæ and tarsi brown, the former a little brighter medially; middle femora light yellow with a rather broad dark brown tip, tibiæ with the base and tip dark brown, the medial portion yellowish brown; tarsi dark brown; hind leg, coxæ and trochanters dark brownish black, femora light yellow with the tip broadly dark brown, tibiæ yellow with the base narrowly dark brown, the tip broadly of the same color, tarsi dark brownish black.

Wings, hyaline, the tip broadly infuscated with light brown; a dark brown basal spot in the region of the arculus; a dark brown triangular stigma which sends a narrow brown seam down along the cord to cell 1st *M*₂. Venation (see Plate xvi, fig. 6): Origin of *Rs* opposite *Sc*_a.

Abdomen dark brownish black, the extreme tergal apices yellow; sternites yellow with brownish black rings.

Female.—Similar, the ovipositor and a ring on the 8th abdominal segment, yellow.

Holotype, ♂, Callanga, Peru.

Allotype, ♀, Callanga, Peru.

Paratype, ♀, Callanga, Peru.

The two types in the Hungarian National Museum, the paratype in the author's collection.

This handsome species agrees most closely with *simplex* Wied. [Aussereur Zweifl. Ins., vol. 1, pp. 549, 550; (*Limnobia*)] but is much smaller, antennæ not yellowish brown and the leg-pattern quite different. From *molesta* O. S. (Biologia Cent. Amer.; vol. 1, pp. 6, 7), it differs in its reddish head; from *gracilis* O. S. (l. c., p. 7), it differs in its thoracic pattern and much smaller size.

***Teucholabis munda*, sp. n. (Pl. XVI, Fig. 7).**

Head dark brown above; pronotum yellow; thorax shiny black; wings hyaline with a broad brown apex and brown marks along the cord; *Rs* very short, arcuated, its origin opposite the tip of *Sc1*.

Male.—Length, 5.5 mm.; wing, 5.8 mm.

Rostrum yellow, palpi brown; antennæ with the basal segment yellow, remaining segments rounded oval, dark brownish, front yellowish, vertex and occiput very dark brown becoming lighter and brighter on the genæ.

Pronotum very light yellow, not very shining. Mesonotum entirely dark shiny black. Pleuræ black. Halteres, stem dark brownish black, the knob light yellow.

Legs, fore coxæ and trochanters light yellow, femora with the basal third yellowish darkening into brownish black apically, tibiæ and tarsi dark brownish black; middle coxæ brown, trochanters yellow, femora brownish yellow, the tip darker, tibiæ and tarsi dark brown; hind coxæ black, trochanters brownish yellow, femora brownish yellow gradually darkening to the brown tip, tibiæ and tarsi dark brownish black.

Wings subhyaline, the whole tip of the wing infuscated with light brown, the inner margin of this infuscation including the extreme tip of cell 1st *M2*; stigma large, dark brown, sending a narrow brown seam along the cord; an indistinct light brown suffusion in cell *M1*, and tips of the two anal cells. Venation (see Plate xvi, fig. 7): *Rs* short and very arcuated at its origin, its base opposite the tip of *Sc1*.

Abdomen with the tergites black, sternites black, the tips of the apical sclerites broadly yellowish.

Holotype, ♂, Callanga, Peru, in the Hungarian National Museum.

T. munda differs from all of the species known to me in the great arcuation of the radial sector.

***Teucholabis paradoxa*, sp. n.** (Pl. XVI, Fig. 8).

Head reddish brown; thorax reddish, unspotted; wings subhyaline with numerous brown spots and dots; cross vein *r-m* not present.

Male.—Length, 5 mm.; wing, 6.6 mm. *Female*.—Length, 6 mm.; wing, 6 mm.

Male and *Female*.—Rostrum reddish, palpi brown; antennæ dark brownish black throughout; front, vertex and occiput shining reddish brown.

Pronotum reddish. Mesonotum and pleuræ reddish yellow without dark markings. Halteres light brown throughout.

Legs, coxæ and trochanters brownish yellow, femora brownish yellow, the tip rather broadly dark brown, tibiæ brown darkest at the tip, tarsi dark brown; fore tibiæ almost uniformly dark brown; the dark femoral apices subequal on all the legs.

Wings, shiny, light yellowish hyaline, with numerous dark brown spots and dots as follows: Cell *C* is brown except for a space near cross vein *h*; *Sc*₂ brown with a space over the middle of cell 1st *R*₁. Four large brown blotches, one at the base of the wing, a second at the origin of *Rs*, a third near the stigma and the last at the end of *R*₁ in cell 2nd *R*₁. Anal angle of the wing dark, a large blotch in the end of cell 1st *A*; smaller blotches at the ends of the longitudinal veins; all of the cells of the wings with abundant rounded brown dots. Venation (see Plate xvi, fig. 8): *Sc* long, *Rs* rather long and rather strongly arcuated so that cell *R* is narrowest at its middle; cross vein *r-m* obliterated by the fusion of *R* 4 plus 5 on *M* 1 plus 2 at the proximal end of cell 1st *M*₂; cell 1st *M*₂ much longer than the veins issuing from it.

Abdomen, base yellowish, in the female tergites 2 to 5 light brown with dark apices; sternites brownish yellow; in the male, several of the basal tergites yellow, the abdomen expanded before the hypopygium, several segments being involved.

Holotype, ♂, Callanga, Peru.

Allotype, ♀, Callanga, Peru.

Types in the Hungarian National Museum.

The only species of *Teucholabis* that I know of with this type of wing-pattern. The obliteration of the *radio-median*

cross-vein by the fusion of *R* 4 plus 5 on *M* 1 plus 2, is a new venational feature for the genus although long known in the related genus *Paratropeza* Schiner.

Genus *Paratropeza* Schiner.

1866. *Paratropeza* Schiner; Verh. Zool. bot. Ges. Wien; vol. 16. p. 932.

A very interesting group of Neotropical crane flies remarkable in the presence of cell *R*2 in the wings, *Paratropeza* being the only genus in the tribe that possesses this character (compare my key to the Antochini, Psyche, vol. 20, No. 1; pp. 40, 41; 1913).

Key to the Species of *Paratropeza*.

1. Cross vein *r-m* obliterated by the fusion of *R* 4 plus 5 on *M* 1 plus 2 2
 Cross vein *r-m* present 4
2. Entire thorax blue black; [head dark purplish; wings with three dark brown bands, one near the wing base, one along the cord and the last on the wing tip; abdomen black, margins of the segments yellowish.] (Brazil, Peru). *collaris* O. S. (1)
 Thorax with at least the scutellum yellowish 3
3. Thoracic præscutum entirely shiny black; wings with a narrow brown seam along the radial cross vein; [head yellow; abdomen rust yellow except the base which is black.] (Colombia). *singularis* Schin. (2)
 Thoracic præscutum reddish yellow with three broad black stripes; wings with a narrow seam along the cord, tip of the wing faintly infuscated; [head reddish yellow.] (Mexico). *praevusta* O. S. (3)
4. Cell 1st *M*2 of the wings open, due to the atrophy of the outer deflection of *M*3; wings with two distinct dark brownish bands; tip of the wing infuscated. (Brazil)... *fasciolaris* Wied. (4)
 Cell 1st *M*2 closed; wings with a narrow brown seam along the cord; tip of the wing not infuscated. (Brazil). *jactans* sp. n.

(1) Osten Sacken, Berl. Ent. Zeitschr.; vol. 31, p. 190 (1887).

(2) Schiner, Novara Reise, Dipt., p. 46, pl. 2, fig. 2 (1868). (Type of the genus).

(3) Osten Sacken, Biol. Cent. Amer., vol. 1, pt. 1, p. 8 (1886).

(4) Wiedemann, Ausser. Zweifl. Insect, vol. 1, suppl., p. 552, pl. 6b, fig. 11 (1828), (as *Limnobia*).

***Paratropeza collaris* Osten Sacken (Pl. XVI, Fig. 9).**

One ♂, from Callanga, Peru. Venation (see Plate xvi, fig. 9); *Rs* very strongly arcuated at its origin; deflection of *R* 4 plus 5 and cross vein *r* almost in a line; cross vein *r-m* obliterated by the fusion of *R* 4 plus 5 on *M* 1 plus 2; basal deflection of *Cu*1 just beyond the fork of *M*.

***Paratropeza jactans*, sp. n. (Pl. XVI, Fig. 10).**

Thoracic præscutum yellowish with broad brown stripes; scutellum yellow; postnotum black; wings with a narrow brown seam along the cord; cross vein *r-m* present; cell 1st *M*2 closed.

Male.—Length, 6 mm.; wing, 6.8 mm.

Rostrum yellow, palpi brown; antennæ with the basal segment brownish yellow, the remaining segments brown; front and vertex brown, darkest on the vertex; occiput reddish brown.

Pronotum yellowish brown. Mesonotal præscutum dull yellow with three broad dark brown stripes confluent behind, the median stripe broad, its sides subparallel, the lateral ones very large, occupying most of the caudo-lateral portions of the sclerite; scutum dull yellow, the lobes with a large rounded dark brown spot; scutellum dull yellow; postnotum dark brownish black. Pleuræ rich reddish yellow, this color including the sternum. Halteres brownish black, the knob light yellow.

Legs, coxæ and trochanters dull yellow, rest of the legs broken.

Wings broadest in the region of the cord, subhyaline with a broadly triangular dark brown stigma, a narrow brown seam along the cord and on the outer end of cell 1st *M*2; an indistinct brown suffusion from the origin of *Rs* caudad across the wing to the tip of 2nd *A*. Venation (see Plate xvi, fig. 10): *Rs* long, very gently arcuated; deflection of *R* 4 plus 5 anterior to the cross vein *r*; cross vein *r-m* present, rather long; cell 1st *M*2 closed; basal deflection of *Cu*1 just beyond the fork of *M*.

Abdominal tergites dark brownish black with a broad yellowish apex to the sclerites; sternites yellowish.

Holotype, ♂, Theresopolis, Brazil, in the Hungarian National Museum.

Genus *Diotrepha* Osten Sacken.

1878. *Diotrepha* Osten Sacken; Cat. Dipt. N. Am.

***Diotrepha omissinervis*, sp. n. (Pl. XIV, Fig. 9).**

Wings uniformly grey, *Sc* long, ending opposite the middle of *Rs*, tip of *R*1 atrophied; femoral and tibial apices dark brown.

Female.—Length, 8.8 mm.; wing, 6 mm.; abdomen, 7.2 mm. Hind leg, femur, 5.8 mm.; tibia, 6.3 mm.; tarsus, 4.6 mm.

Rostrum and palpi dark brown; antennæ with the two basal seg-

ments dark brown, the flagellar segments much paler, whitish; front, vertex and occiput light greyish brown, darker behind.

Mesonotal præscutum light brown, unmarked; scutum, scutellum and postnotum of about the same color, the latter a little darker. Pleuræ uniformly brown. Halteres brown, the base of the stem paler.

Legs, coxæ and trochanters dull yellow, femora almost white with the tip broadly dark brown, tibiæ whitish with the tip very narrowly dark brown; tarsi whitish, the two terminal segments becoming more infuscated.

Wings with a grey suffusion, veins rather pale. Venation (see Plate xiv, fig. 9): *Sc* long, ending about opposite the middle of *Rs*, *Sc2* at its extreme tip, the terminal portion of *R1* beyond the cross vein *r*, atrophied.

Abdomen long, uniform dark brown, the sternites rather brighter.

Holotype, ♀, Songo, Bolivia, in the Hungarian National Museum.

From *mirabilis* Osten Sacken (1), the only described species with dark femoral and tibial apices, this species differs as follows: *Sc* much longer, ending near the middle of *Rs* instead of just beyond its origin; the atrophy of the tip of *R1* distinguishes *omissinervis* from all of the described forms.

Genus *Toxorhina* Loew.

1851. *Toxorhina* Loew.; Linnæa Entomologica, vol. 5, p. 400.

Toxorhina brasiliensis Westwood.

One ♀ from San Bernadino, Paraguay. Fiebrig, 1908.

Genus *Atarba* Osten Sacken.

1869. *Atarba* Osten Sacken; Monographs of the Dipt. of N. Am., vol. 4, pp. 127, 128.

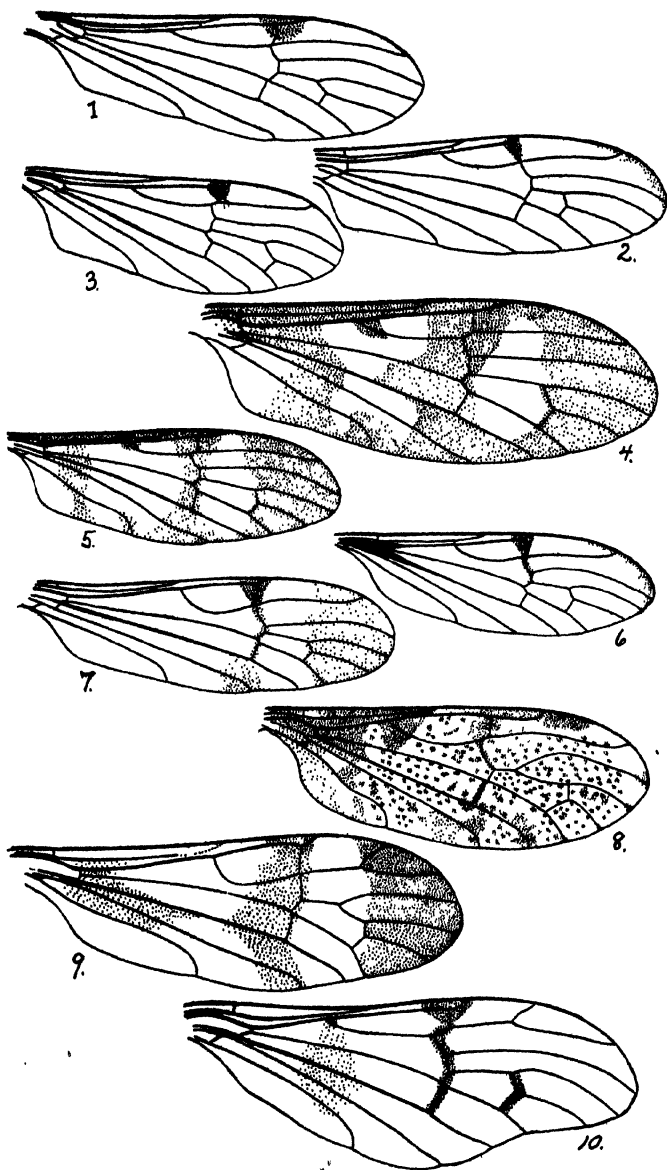
Atarba varicornis, sp. n. (Pl. XIV, Fig. 10).

Antennæ very long, annulated dark brown and yellowish; femora unicolorous; wings without a stigmal spot; valves of the ovipositor very powerful; abdominal tergites dark brown.

Female.—Length, 4.2 mm.; wing, 4.9 mm.

Rostrum yellowish, the palpi a little darker; antennæ with the scapal segments dull yellow, flagellum with the basal half of each segment light yellow, the apical half abruptly dark brown, the terminal two or three segments uniformly brown; front and occiput dull brownish yellow, the vertex a little darker brown.

(1) Osten Sacken, Cat. Dipt. N. Am., p. 220 (1878); Williston, Trans. Ent. Soc. Lond., pt. 3, p. 291, fig. 65 (1896).



NEOTROPICAL TIPULIDAE—ALEXANDER.

Thoracic dorsum dull rich yellow, the postnotum a little more greyish. Pleuræ dull yellowish with a faint greyish bloom. Halteres light yellowish brown.

Legs, coxæ and trochanters yellow, femora, tibiæ and tarsi dull yellow, the latter passing into brown beyond the metatarsus.

Wings with a faint yellowish tinge, stigma very feebly indicated; venation (see Plate xiv, fig. 10.)

Abdomen brown, valves of the ovipositor very large, powerful, yellow, sternum light yellow, the sides of the sclerites broadly margined with brown.

Holotype, ♀, Callanga, Peru, in the Hungarian National Museum.

This is the third true *Atarba* described since the erection of the genus in 1869. It is closely allied to *picticornis* O. S., of the Eastern United States but is much smaller (wing of ♀, under 5 mm.; in *picticornis*, over 6 mm.); valves of the ovipositor very long, stout, the upper valve with the basal two-thirds enlarged, the apical third slender, acicular, lower valves flattened, blade-like; upper valves much longer than the lower valves; the abdominal tergites dark brown, in *picticornis*, the tergites dull yellow.

EXPLANATION OF PLATE XVI.

- Fig. 1. Wing of *Teucholabis tristis* sp. n.; ♀.
- Fig. 2. Wing of *Teucholabis fulgens* sp. n.; ♀.
- Fig. 3. Wing of *Teucholabis jocosa* sp. n.; ♀.
- Fig. 4. Wing of *Teucholabis jucunda* sp. n.; ♀.
- Fig. 5. Wing of *Teucholabis laeta* sp. n.; ♂.
- Fig. 6. Wing of *Teucholabis hilaris* sp. n.; ♀.
- Fig. 7. Wing of *Teucholabis munda* sp. n.; ♂.
- Fig. 8. Wing of *Teucholabis paradoxa* sp. n.; ♀.
- Fig. 9. Wing of *Paratropeza collaris* Osten Sacken; ♂.
- Fig. 10. Wing of *Paratropeza jactans* sp. n.; ♂.

Notice to Authors.

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A New *Argynnis* from Utah (Lep.).

By HENRY SKINNER.

Argynnis laurenti n. sp.

Expanse 19-21 mm. *Upperside*. Primaries ochraceous-orange (very nearly the color of *A. atossa*) with the markings in a general way similar to those of *helena*, *chariclea* and *triclaris*, but instead of the usual row of crescent-shaped spots between the row of dots across the wing and the exterior margin, there is a sinuous, narrow line of fuscous, and the marginal line has a very little fuscous at the ends of the veins. The secondaries also have the same characteristic line, replacing the lunate spots seen in the allied species. There is also a distinct and comparatively large black spot in the disc near the base of the wing which is obsolete or nearly so in the allied species.

Underside. Primaries marked as above and the large round spots distinct and well defined. The band of yellow spots of the secondaries extending across the wing from the costa to the inner margin, in a general way is like that of *helena* but differs much in detail. The veins divide this band into nine spots, the triangular one, which is the third from the costa, is much less acute than in *helena* and there is an additional spot extending from the base of this spot in the new species. The seventh spot from the costa, which is shaped like an hour-glass, is much longer than the similar spot in *helena*. This band extends to the inner margin, which is not the case in *helena*.

The marginal silvery or white lunules are entirely wanting in this species. The lighter color, the waved line on both wings, above and below, and the absence of the silvery lunules of the secondaries below, will readily separate this species from its congeners.

Described from eight specimens taken by Mr. Philip Laurent and the author, at Silver Lake (Brightons), Utah, July 10th to 14th, 1899.

Type in the collection of the Academy of Natural Sciences of Philadelphia. Named in honor of Mr. Philip Laurent, Director of the Entomological Section of the Academy.

Lectures on Insects.

Mr. Edward F. Bigelow, President of the Agassiz Association, Arcadia, Sound Beach, Connecticut, is planning to enter the lecture field more extensively in the future, and announces, as two of his topics, "The most wonderful of all insects—the Honey Bee" and "In the Microscopical World."

A new North American Genus Belonging to the Group *Nemobiites* (Orthoptera, Gryllidae).

By MORGAN HEBARD, Philadelphia, Pa.

*Hygronemobius** n. gen.

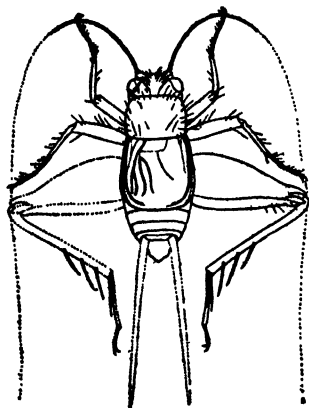
1905. *Nemobius* Morse (not of Serville, 1839), Psyche, XII, pp. 21-22.

The genus is monotypic. Genotype—*Hygronemobius alleni* [*Nemobius alleni*] (Morse).

Allied to *Nemobius*,† from which genus it may be separated by the somewhat differently shaped pronotum, much reduced tympanum of the caudal face of the cephalic femora and very different armament of the caudal tibiae.

Though nearer to *Nemobius* than to any of the other allied genera, the facts that in the present genus the tegmina of the male lack a tympanum and the caudal tibiae are each supplied with five, not six, distal spurs, show that in these characters it agrees instead with *Paranemobius*,‡ which genus is, however, very different in numerous other important respects.

Generic Description.—Size small; form compact; body pubescent and sparsely clothed with hairs. Head and its appendages similar to *Nemobius*, but with interantennal protuberance somewhat more feeble. Pronotum similar to *Nemobius*, excepting the ventro-cephalic angles of lateral lobes which are rectangulate and much sharper than the ventro-caudal angles. Tegmina very abbreviate in the male§ and wanting a tambourine, having a single oblique vein as in *Nemobius*. Wings absent. Caudal face of cephalic tibiae bearing a small,



*From ὑγρός = moist, and *Nemobius* = grove-dweller.

† 1839. Serville. Hist. Nat. des Ins., Orth., p. 345.

‡ 1877. Saussure. Melang. Orth., II, Fasc. V, pp. 226, 231, 234-235, fig. IV.

§ All of the females known of this genus are nymphal, and Morse's statement that this sex is wingless, as well as his description of the ovipositor, in consequence cannot be used as characters for the genus or species. The nymphal females, though about two-thirds grown, show no trace of tegminal development.

scarcely perceptible, ovoid tympanum, corresponding portion of cephalic face not swollen. Caudal femora greatly dilated; caudal tibiae with dorsal margins each armed with three pairs of extremely long, widely spaced, unmodified, mobile spines* placed in a double row and armed distad with three external and two internal spurs. The ventro-internal spur, always present in *Nemobius*, is missing in the present genus. Caudal metatarsi non-sulcate and unarmed dorsad.

Remarks.—With the exception of the characters given for the female, the original description of *H. allenii*, with which is also given valuable data on the capture and habits of the insect, is excellent. A study of the North American species of the genus *Nemobius* has prompted the examination and study of the typical material of this insect.

The peculiar reduction of the tegmina in the male of this insect is shown in the figure here given.

Distribution.—This genus is known only from the mangrove swamps of Moraine Cay in the northern Bahamas.

A New Parasite of the House Fly (Acarina, Gamasoidea).

By H. E. EWING, Corvallis, Oregon.

(Plate XVII.)

The great interest which of recent years has attached to the house fly because of the discovery of its role as a disease-carrier has caused economic entomologists to consider all possible means which may be employed for its control. As in the case of most insect pests, natural enemies have received much attention in this regard. So far, although no one species has been found that offers any serious check to the increase of the house fly, many have been recorded as preying upon it. Dr.

* These spines are evenly rounded and covered with hairs, but have, like in *Nemobius*, their apices uncinatè, smooth, sharp and hard.

L. O. Howard, in his excellent volume on this pest, gives a whole chapter upon its natural enemies. These, as the author states, "begin with the acme of the vertebrate series (man himself) and end with the lower forms of plant life." Among the natural enemies listed are included: fungous diseases, protozoa, nematodes, mites, spiders, the house centipede, predaceous and parasitic insects, birds, and fly-catching rats. The parasite which I have to report is of biological interest chiefly, yet those interested in economic entomology may be glad to note that another natural enemy has been recorded for our dreaded *Musca domestica*.

HABITS.

For several years the writer has noticed that a house fly is occasionally found flying about with a rather large gamasid mite hanging to it. I have caught many such flies in houses and in laboratories, and others have sent to me flies which carried this mite upon their bodies. I never have noticed more than a single gamasid upon a single fly, and this individual has usually been found running about on the body of its host. It is well known that flies, as well as many other insects, carry non-parasitic mites, especially of the family *Gamasidae*, whereby the distribution of the latter is effected. Beetles, especially, may carry a score or more of non-parasitic mites upon their bodies for long distances. In fact I have frequently found such individuals almost or quite concealed by scores of the nymphs of the genus *Uropoda*, all of which were getting a "free ride," though these injured their pseudo-host in no way. For these reasons I paid little attention to the first gamasid mites found on flies.

While at Ithaca, New York, my attention was frequently called to house flies that carried this gamasid mite. Upon an investigation I succeeded in finding mites that had their chelicerae inserted into the ventral body wall of the fly, and in one case the mite remained so attached after being killed, along with its host.

When these mites feed upon the house fly they attach themselves always at a definite place. This is at the base of the

abdomen on its ventral surface, the anterior end of the mite being directed toward the head of the fly. The reason for the mite always taking this position is not quite clear at present. I can see two advantages in it, however; first, the mite is in a place protected from the attacks of its host; second, this position does not throw the fly out of balance when flying. In all cases thus far only the females of this parasitic mite have been found. The description of the species follows.

DESCRIPTION OF SPECIES.

Macrocheles muscae n. sp.

General appearance stout, robust; integument well chitinated, hence color a dark yellowish brown. Body clothed very sparsely with small, simple, curved bristles.

Mouth-parts well developed. Palpi about one-half as long as first pair of legs; first segment longest, concave on its inner margin, and about four-fifths as long as femur of leg I; second segment slightly shorter than the first; third subequal to the second; fourth slightly over one-half as long as the third, bearing many setae or hairs and a long prominent bristle slightly longer than the segment itself on its outer margin; distal segment very short, about one-third as long as segment four, and immovably joined to this segment; it has many bristles, a prominent spine at its base on the inside, and a long, slightly curved, tactile spine at its apex. Chelicerae retractile, when extended slightly surpassing the palpi; geniculate at about their middle, and strongly chelate at the apex; chelae stout, well chitinated, each with a prominent tooth on its inner margin; fixed chela with a small spine on its upper margin about one-third the distance from its base to apex; at the base of the fixed chela on its lower side is situated a long pectinate seta, about equal to the chelae themselves in length and with barbs on one side only. Hypostome prominent; about two and one-half times as long as broad, with three prominent bristles, and ending in two large cusps, between which is the tongue or lingula; lingula as long as the cusps of the hypostome, with some hairs along its sides, divided at its median line into halves each of which ends in a curved setaceous tip.

Cephalothorax not demarcated from abdomen; bearing a pair of small anteriorly directed setae on its anterior margin near the median line. Shoulder bristles but little larger than the other bristles of the body. Sternum extending to between the third pair of coxae; posterior margin concave. The sternum bears three pairs of subequal, backwardly directed, simple, almost straight setae.

Abdomen broad, evenly rounded behind. Peritreme extending from

the anterior margin of the cephalothorax to the level of the third coxae; it is bent upon itself just before the stigma is reached. Stigmal plate extending but little beyond the stigma, truncate at this end and of about equal width throughout its length, and bearing two obscure hairs, one on each side of the stigma. Metasternalia present, small, triangular; each bearing a simple, curved seta. Genital plate semidisc-shaped, with a single pair of bristles. This plate is situated directly between the fourth pair of coxae, and joins the anal plate along a straight, transverse suture. Anal plate large, somewhat shield-shaped; with four pairs of bristles. Anus circular, situated near the posterior margin of anal plate, surrounded with a thickened border of chitin in the form of a collar; at the outside margin of the collar is situated one of the four pairs of setae found on the anal plate.

Legs stout; anterior pair as long as the body; second pair about three-fourths as long, but much thickened; third pair subequal in length to second; last pair equal to the first in length, and extending beyond the posterior margin of the abdomen by the full length of its last two segments. Tarsus of leg I slightly longer than tibia, and ending in several tactile hairs; tibia considerably longer than patella; patella subequal to femur. The tarsi of the last three pairs of legs each bear a stout pair of claws, between which is situated an expanded, hyaline pulvillus. The spines toward the end of tarsus of leg II are suddenly narrowed near their tips, and end in strongly chitinized, thorn-like processes. Length of body, 0.97 mm.; width, 0.62 mm.

From Ithaca, New York, on *Musca domestica*, by Dr. J. F. Illingworth and by the writer. From Corvallis, Oregon, on *Musca domestica*, by the writer.

Description made from five female specimens, one of which was dissected. This species is quite distinct from any of our known American forms. I find that according to natural arrangement it comes next to *Macrocheles muscorum* Ewing, in my collection. It differs from this species in being about twice as large, in having triangular metasternalia instead of circular, in having the anal plate subshield-shaped instead of being oblong oval, as well as in many other particulars.

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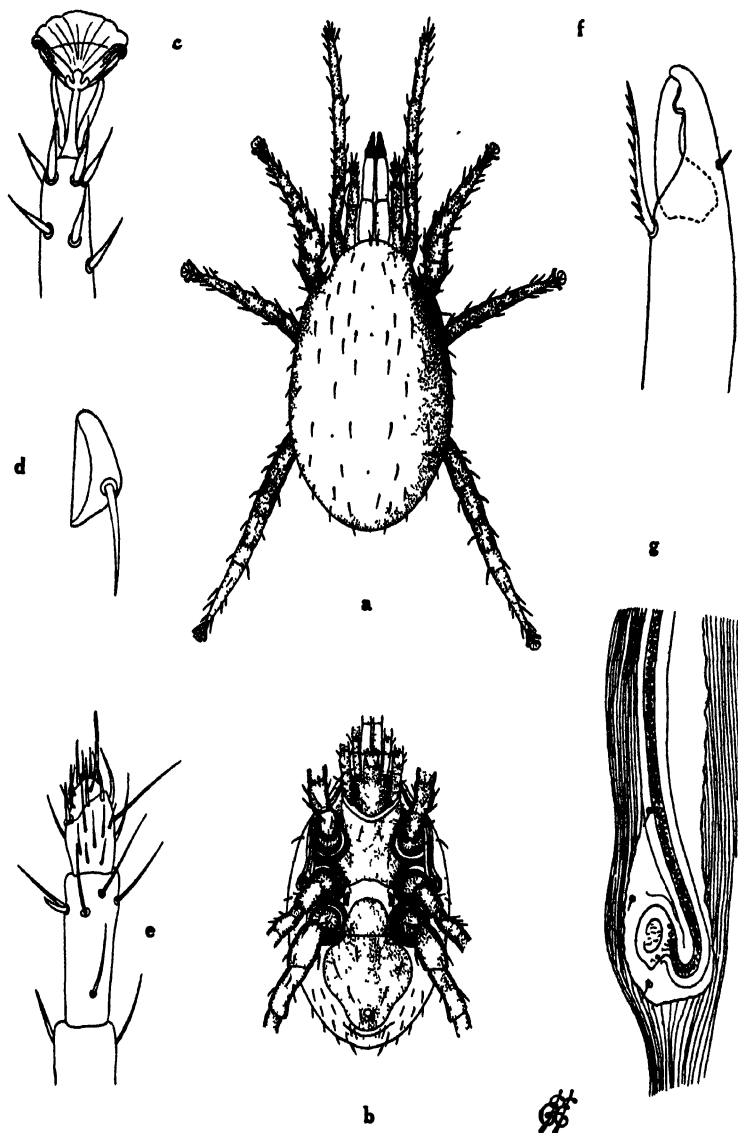
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EXPLANATION OF PLATE XVII.

Macrocheles muscae n. sp. *a*, Adult female, dorsal view; *b*, ventral view of body of female; *c*, ventral view of distal end of tarsus of leg II; *d*, left metasternalium; *e*, tip of right palpus as seen from above; *f*, outside view of chela of left chelicera; *g*, posterior part of peritreme and stigmal plate showing the tracheal trunk filled with air vacuoles.

Crane-flies and Sweets (Diptera).

Mr. Claude Morley, in *The Entomologist*, for July, 1913, mentions observing *Tipula* sucking sweets. He says: "On May 23rd I was much struck by the unwonted attitude of a female *Tipula peliostigma*, which was sitting on a dogwood leaf with her body closely appressed. This appeared so unusual in the insects of this genus, which seem to invariably stand high upon the tips of their elongate legs, that I looked more closely, and found that she was greedily sucking the honey dew which had fallen from a batch of aphids. * * * I have never met with *Tipulae* on honey dew before, and consider the incident remarkable; but that the genus is fond of sweets is, I believe, a well known fact." He further mentions observing species of this genus "distinctly sucking the sweets from the stylopods of *Angelica sylvestris* * * *," and of taking them on overnight "sugar."



MACROCHELES MUSCAE—EWING.

Three new Genera of Chalcidoid Hymenoptera from Queensland.

By A. A. GIRAULT, Nelson (Cairns), North Queensland, Australia.

Types of the following species are in the Queensland Museum, Brisbane.

Family EULOPHIDAE.

EULOPHINI.

Eulophinusia new genus.

Female.—Differing from all the genera of its tribe in bearing 8-jointed antennæ with a 4-jointed funicle, the club solid, one ring-joint. Scutellum simple; parapsidal furrows not complete, only cephalad. Antennal club not terminating in a nipple. Propodeum with a short median carina. Mesopost-scutellum rather large, well separated; pronotum also well separated. Postmarginal vein long, a third longer than the stigmal, the marginal vein shorter than the submarginal. Small. Abdomen ovate. Marginal vein about two and a quarter times the length of the stigmal. Antennæ inserted on a level with the ventral ends of the eyes. Mandibles with four or five minute teeth. Abdominal segments more or less equal, none greatly lengthened.

Male.—Not known.

Type.—The following species:

1. *Eulophinusia cydippe* n. sp.

Female.—Length, 1.12 mm.

Dark metallic green, the abdomen coppery, the wings hyaline, the antennæ dusky; legs yellowish white but the coxæ more or less concolorous. Thorax densely, finely, scaly reticulated but the scutellum and propodeum much finer, opaque or very finely alutaceous. First and second funicle joints longer than wide, subequal, longest of the funicle, the remaining two more or less subequal, wider than long; club short but longer than any of the funicle joints, the first of which is only slightly shorter than the pedicel.

(From one specimen, 2-3-inch objective; 1-inch optic, Bausch and Lomb.)

Male.—Not known.

Described from a solitary specimen captured by sweeping foliage and grass of forest along the military road, March 3, 1912.

Habitat.—Australia, Thursday Island (Torres Strait).

Type.—The above specimen on a tag, the head, a hind leg and a fore wing on a slide with the type of *Archenomus niger* Girault.

OPHELININI.

Opheliminus new genus.

Female.—Like *Alophomorpha* Girault in antennal structure and otherwise but the scutellum is simple, the median carina of the propodeum is present but the short sulcus on each side absent. Also the abdomen is long, pointed conic-ovate, depressed above, as long as the head and thorax combined. Mandibles with about five teeth.

Male.—Not known.

Type.—The following species:

1. *Opheliminus grotii* n. sp.

Female.—Length, 2.50 mm.

Brilliant metallic green, the wings hyaline, the abdomen dark purplish, dorsad with a pale yellowish, large, subquadrate area centrally a short distance from base; ventrad this area is noticeably larger. Legs white except proximal part of hind coxa; scape also white, edged with dusky above, the flagellum black, the first funicle joint about twice the length of the pedicel, the second and third joints subequal and little the longest and stoutest; first club joint longest, equal in length to the other two combined. Reticulated, including the propodeum. Fore wings densely ciliate discally, the marginal cilia extremely short.

(From one specimen, similarly magnified.)

Male.—Not known.

Described from a single female captured by sweeping in forest and along a jungle-clad forest streamlet, June 27, 1913.

Habitat.—Australia, Nelson (Cairns), North Queensland.

Type.—The above specimen on a tag, the head and hind tibiae together on a slide.

This beautiful species is respectfully dedicated to Hugo Grotius.

ELACHERINI.

Genus *Pseudiglyphus* Girault.

This genus was originally assigned to the Hemiptersenini, but it belongs here since the parapsidal furrows are complete.

Family EURYTOMIDÆ.

Genus *Bephratoides* Girault (*nec* Brues).

This name is preoccupied. For it I propose the new name, *Bephratelloides*.

Family PTEROMALIDÆ.

SPHEGIGASTERINI.

Polycystoides new genus.

Female.—Like *Polycystus* Westwood but the antennæ only 11-jointed, the club solid; moreover, the petiole of the abdomen is short and stout, the median carina of the propodeum is intersected by a distinct transverse carina from side to side and the cephalic margin of the propodeum is carinated; the propodeum with a distinct neck and spiracular sulci; between the median carina and the spiracle along the cephalic margin is a large fovea. Mandibles strongly tridentate; transverse suture on scutellum faint. Second abdominal segment occupying about a fourth of the surface. Propodeum reticulated, the thorax inflexed at the scutellum. Head very large but wider than long. Postmarginal vein longer than the stigmal. Distal margin of scutellum carinated. Antennæ with two ring-joints. Abdomen stout, conic-ovate, somewhat longer than the thorax. Axillæ widely separated. Parapsidal furrows incomplete. Hind margins of abdominal segments straight.

Male.—Not known.

Type.—The following species:

1. *Polycystoides tennysoni* n. sp.

Female.—Length, 2.50 mm.

Dark blue, opaque and punctate, the wings hyaline, the abdomen shining aeneous green; legs and antennæ yellowish brown but the coxæ dark blue and the club (which is enlarged) and distal funicle joint are black. Ring joints stout; first three funicle joints distinctly longer than wide, of them 2 and 3 longest, subequal, each a little shorter than the pedicel; joint 4 of funicle only a little longer than wide; joints 5 and 6 shortening, 6 distinctly much wider than long. Club about half the length of the funicle. Scape long and cylindrical. Tarsi pale.

(From one specimen, similarly magnified.)

Male.—Not known.

Described from a single female captured April 13, 1913, by sweeping along the edges of the jungle.

Habitat.—Australia, Nelson (Cairns), Queensland.

Type.—The above specimen on a tag, the hind legs and head on a slide.

This remarkable form is dedicated with respect to the poet Tennyson.

Preliminary List of Heterocera Captured in and around St. Louis, Missouri (Lep.).

Sphingidae to Sesiidae Arranged According to Dyar's List of North American Lepidoptera.

Compiled by PAUL A. SCHROERS, St. Louis, Mo.

SPHINGIDAE.

- 653 *Hemaris diffinis* *Boisd.*
 a. axillaris *Gr. & Rob.*
 656 *thysbe* *Fab.*
 a. ruficaudis *Kir.*
 667 *Amphyon nessus* *Cr.*
 668 *Sphecodina abbottii* *Swain.*
 669 *Deidamia inscriptum* *Har.*
 670 *Deilephila gallii* *Rott.*
 671 *lineata* *Fab.*
 672 *Theretra tersa* *L.*
 677 *Pholus vitis* *L.* (one spec.
 by F. Malkmus).
 678 *pandorus* *Hüb.*
 679 *achemon* *Dr.*
 681 *Ampelophaga choerilus* *Cr.*
 682 *myron* *Cr.*
 683 *versicolor*
 Har.
 686 *Dilophonota ello* *L.*
 692 *obscura* *Fab.*
 696 *Phlegethontius celeus* *Hüb.*
 697 *sexta* *Joh.*
 699a *cingulata*
 Fab. (one specimen).
 701 *Sphinx drupiferarum* *Sm. & Abb.*

- 703 *Sphinx gordius* *Stoll.*
 704 *luscitiosa* *Clem.*
 706 *chersis* *Hüb.*
 716 *eremitus* *Hüb.*
 717 *plebeja* *Fab.*
 719 *Dolba hylaeus* *Dr.*
 721 *Ceratomia amyntor* *Geyer.*
 722 *undulosa* *Walk.*
 724 *catalpae* *Boisd.*
 728 *Marumba modesta* *Har.*
 729 *Smerinthus jamaicensis* *Dr.*
 731 *Paonias excoecatus* *Sm. & Ab.*
 732 *myops* *Sm. & Ab.*
 734 *Cressonia juglandis* *Sm. & Ab.*

SATURNIIDAE.

- 739 *Samia cecropia* *L.*
 744 *Callosamia promethea* *Dr.*
 747 *Tropaea luna* *L.*
 748 *Telea polyphemus* *Cr.*
 753 *Automeris io* *Fab.*

CERATOCAMPIDAE.

- 767 *Anisota stigma* *Fab.*
 770 *virginiensis* *Dr.*
 771 *rubicunda* *Fab.*
 772 *Adelocephala bicolor* *Har.*
 774 *Syssisphinx bisecta* *Lint.*
 776 *Citheronia regalis* *Fab.*

- 778 *Basilona imperialis* Dr.
 787 *Scepsis fulvicollis* Hüb.
 792 *Lycomorpha pholus* Dr. (by
 G. Hosenfeldt).
 798 *Ctenucha virginica* Charp.

LITHOSIIDÆ.

- 807 *Hypoprepia miniata* Kir.

ARCTIIDÆ.

- 834 *Eubaphe aurantiaca* var.
 a. *rubicundaria* Hüb.
 c. *brevicornis* Wal.
 836 *Utetheisa bella* L.
 837 *ornatrix* L.
 838 *Haploa clymene* Brown.
 839 *colonna* Hüb.
 840 *lecontei* Boisd.
 Var. c. *militaris* Harvey.
 f. *vestalis* Pack.
 841 *confusa* Lyman.
 843 *Euerythra phasma* Harvey.
 846 *Ecpantheria deflorata* Fab.
 var. b. *denudata* Slosson.
 851 *Estigmene acraea* Dr.
 854 *congrua* Walk.
 855 *Hyphantria cunea* Dr.
 856 *textor* Har.
 859 *Isia isabella* Sm. & Ab.
 862 *Diacrisia virginica* Fab.
 874 *Apantesis virgo* L.
 879 *oithona* Str.
 var. a. *rectilinea* French.
 880 *anna* Gr.
 var. a. *persephone* Gr.
 882 *arge* Dr.
 892 *figurata* Dr.
 894 *nais* Dr.
 895 *vittata* Fab.
 var. a. *radians*.
 b. *phalerata* Har.

- 907 *Ammalo eglenensis* Cl.
 910 *Euchaetias egle* Dr.
 917 *Pygarctia spraguei* Gr. (one spec.)
 919 *Halisidota tessellaris* Sm. & Ab.

ACARISTIDÆ

- 949 *Alypia octomaculata* Fab.

NOCTUIDÆ.

- 964 *Charadra deridens* Walk.
 967 *illudens* Guenée.
 968 *Raphia frater* Gr.
 972 *Apatela americana* Har.
 983 *populi* Riley.
 984 *lepusculina* Guen.
 990 *morula* Gr.
 991 *interrupta* Guen.
 993 *lobeliae* Guen.
 994 *furcifera* Guen.
 995 *hasta* Guen.
 999 *radcliffei* Har.
 1007 *connecta* Gr.
 1012 *vinnula* Gr.
 1014 *grisea* Walk.
 1024 *modica* Walk.
 1026 *brumosa* Guen.
 1037 *xyliniformis* Guen.
 1039 *impleta* Walk.
 1041 *oblinita* Sm. & Ab.
 1053 *Harrisimemna trisignata* Walk.
 1054 *Microcoelia dipteroides* Guen.
 1055 *Jaspidea lepidula* Gr.
 1059 *teratophora* Her.-Sch.
 1060 *Diphtera fallax* Her.-Sch.
 1067 *Chytonix palliatricula* Guen.
 1074 *Baileya australis* Gr.
 1084 *Catabena lineolata* Walk.
 1087 *Crambodes talidiformis* Guen.
 1088 *Platysenta videns* Guen.
 1089 *albipuncta* Gr.

- 1092 *Balsa malana* *Fitch*.
 1100 *Anortodes prima* *Smith*.
 1115 *Perigea xanthioides* *Guen.*
 1117 *vecors* *Guen.*
 1158 *Hadena modica* *Guen.*
 1116 *mactata* *Guen.*
 1202 *miseloides* *Guen.*
 1212 *passer* *Guen.*
 1220 *vultuosa* *Gr.*
 1227 *dubitans* *Walk.*
 1230 *ducta* *Gr.*
 1232 *devastatrix* *Brace.*
 1235 *arctica* *Boisd.*
 1267 *Polia diversilineata* *Gr.*
 1277 *Dryobota illocata* *Walk.*
 1289 *Trachea delicata* *Gr.*
 1290 *Dipterygea scabriuscula* *L.*
 1291 *Actinotia ramosula* *Guen.*
 1295 *Pyrophila pyramidoides*
 Guen.
 1300 *Prodenia ornithogalli* *Guen.*
 1302 *Laphygma frugiperda* *Sm.*
 & *Ab.*
 1312 *Homohadena badistriga* *Gr.*
 1397 *Rhynchagrotis alternata*
 Gr.
 1454 *Agrotis ypsilon* *Rottem.*
 1467 *Peridroma margaritosa* var.
 a. saucia *Hüb.*
 1476 *Noctua normaniana* *Gr.*
 1478 *bicarnea* *Guen.*
 1481 *c-nigrum* *L.*
 1484 *phyllophora* *Gr.*
 1489 *fennica* *Tausch.*
 1490 *plecta* *L.*
 1514 *lubricans* *Guen.*
 1538 *Feltia subgothica* *Haw.*
 1545 *venerabilis* *Walk.*
 1552 *Porosagrotis vetusta* *Walk.*
 1559 *rileyana* *Morr.*
 1574 *Paragrotis quadridentata* *Gr.*
 & *Rob.*
 1598 *perpolita* *Morr.*
 1603 *velleripennis* *Gr.*
 1649 *messoria* *Har.*
 1708 *Paragrotis albipennis* *Gr.*
 1753 *Anytus privatus* *Walk.*
 1762 *Ufeus satyricus* *Grote.* Sev-
 eral specimens taken by
 Mr. C. Heink, December
 25th, 1904.
 1781 *Mamestra meditata* *Gr.*
 1796 *subjuncta* *Gr. &*
 Rob.
 1807 *picta* *Har.*
 1810 *latex* *Guen.*
 1829 *renigera* *Steph-*
 ens.
 1842 *lorea* *Guen.*
 1890 *Morrisonia confusa* *Hüb.*
 1950 *Nephelodes minians* *Guen.*
 1953 *Heliophila unipuncta* *Haw.*
 1954 *pseudargyra*
 Guen.
 1962 *rubripennis* *Gr.*
 & *Rob.*
 1963 *albilinea* *Hüb.*
 1978 *multilinea* *Walk.*
 1996 *Orthodes crenulata* *But.*
 1997 *cynica* *Guen.*
 1998 *vecors* *Guen.*
 2040 *Graphiphora alia* *Guen.*
 2059 *Perigrapha prima* *Smith.*
 2090 *Xilina antennata* *Walk.*
 2127 *Cucullia asteroides* *Guen.*
 2142 *Rancora solidaginis* (one
 spec.)
 2147 *Bellura gortynides* *Walk.*
 2151 *Nonagria subflava* *Gr.*
 2178 *Papaipema purpurifascia*
 Gr. & Rob.
 2197 *Pyrrhia umbra* *Hüfnagel.*
 2207 *Scolecapteryx libatrix* *L.*
 2208 *Choeophora fungorum* *Gr.*
 & *Rob.*
 2214 *Tapinostola variana* *Morr.*
 2222 *Orthosia bicolorago* *Guen.*
 a. ferruginoides
 Guen.
 2225 *aurantiago* *Guen.*

- 2230 *Orthosia helva* Gr.
 2237 *Scopelosoma moffatiana* Gr.
 2249 *Glaea sericea* Morr.
 2255 *Epiglaea decliva* Gr.
 2300 *Heliothis armiger* Hüb.
 2307 *Rhodophora florida* Guen.
 2324 *Schinia chrysellus* Gr.
 2332 *trifascia* Hüb.
 2339 *nundina* Dr.
 2346 *lynx* Guen.
 2351 *tertia* Gr.
 2353 *jaguarina* Guen.
 2354 *arcifera* Guen.
 2360 *thoreau* Gr. &
 Rob.
 2361 *marginata* Haw.
 2427 *Psychomorpha epimenis* Dr.
 2428 *Euthisaniota unio* Hüb.
 2430 *grata* Fab.
 2432 *Noropsis hieroglyphica* Cr.
 1 specimen by Mr. G.
 Hosenfeldt.
 2437 *Cirrhophanus triangulifer*
 Gr.
 2443 *Basilodes pepita* Guen.
 2448 *Stiria rugifrons* Gr.
 2452 *Stibadium spumosum* Gr.
 2456 *Plagiomimicus pityochro-*
 mus Gr.
 2464 *Plusiodonta compressipalpis*
 Guen.
 2469 *Panchrysia purpurigera*
 Walk.
 2474 *Plusia aerea* Hüb.
 2476 *balluca* Geyer.
 2480 *Euchalcia venusta* Walk.
 2485 *Autographa biloba* Steph.
 2486 *verruca* Fab.
 2487 *rogationis*
 Guen.
 2488 *precationis*
 Guen.
 2493 *ou* Guen.
 2496 *brassicae* Riley.
- 2517 *Autographa ampla* Walk.
 2519a *simplex* Kir.
 2540 *Ogdoconta cinereola* Guen.
 2541 *carneola* Smith.
 2545 *Paectes abrostoloides* Guen.
 2548 *occulatrix* Guen.
 2551 *Marasmalus inficita* Wal.
 2554 *Pteraetholix bullula* Gr.
 2555 *Alabama argillacea* Hüb.
 2560 *Scolecocampa liburna* Geyer.
 2606 *Eustrotia musta* Gr. & Rob.
 2607 *musculosa* Guen.
 2612 *apicosa* Haw.
 2613 *carneola* Guen.
 2618 *Galgula hepara* Guen.
 2653 *Metaponia obtusa* Her.-Sch.
 2654 *perflava* Harvey.
 2656 *Chamyris cerintha* Treit-
 schke.
 2665 *Tarache lactipennis* Har.
 2674 *aprica* Hüb.
 2691 *candefacta* Hüb.
 2699 *Fruva apicella* Gr.
 2702 *Spragueia onagrus* Guen.
 2711 *guttata* Gr.
 2728 *Hyamia perditalis* Walk.
 2734 *Homopyralis contracta*
 Walk.
 2739 *Isogona natatrix* Guen.
 2740 *Hypsophora monilis* Fab.
 2754 *Drasteria erechtea* Cr.
 2755 *crassiuscula* Haw.
 2758 *Caenurgia convalescens*
 Guen.
 2760 *Euclidia cuspeida* Hüb.
 2764 *Panula inconstans* Guen.
 2767 *Meliopotis nigrescens* Gr. &
 Rob.
 2772 *versabilis* Har.
 2806 *Catocala epione* Dr.
 2807 *sappho* Str., one
 specimen.
 2808 *agrippina* Str.
 2810 *lacrymosa* Guen.

Aesthetic Appreciation in Entomology.

By HARRY B. WEISS, New Brunswick, N. J.

Perhaps at the outset it would be well to explain in a general way just what is meant by aesthetic appreciation. An aesthetic experience, for example, is a consciousness of the beautiful, but never of the unattractive or ugly. It varies more or less with different people and what one person may consider beautiful, another will consider ugly.

The perception of some insects for instance is associated with feelings of pleasure and attraction, while others give rise to disagreeable and repulsive feelings. Practically everybody experiences the former feelings while viewing members of the Lepidoptera, while only persons having a wider knowledge of entomology will experience such feelings in connection with the Hemiptera. In other words, most people like to look at a butterfly or moth, but all other insects are classed as more or less repulsive "bugs."

As a rule the majority of people will credit the pleasurable feelings to the diverse colors of the Lepidoptera and, while they contribute somewhat to the total result, the aesthetic value of this order depends mostly on the curved lines and bilateral symmetry of its members. Curved lines are more pleasing and are considered more beautiful than straight or broken lines. It is only with difficulty that broken lines are grasped as a whole, while the direct opposite is true of continuous curves. Gradual or sweeping curves are also more pleasing than abrupt ones, this being apparent when *Tropaea luna* is viewed along with, say, *Papilio turnus*. While the delicate green of *Tropaea luna* is undoubtedly attractive, yet its aesthetic value is due to its exquisite curves and symmetry.

In a general way, a gradual curve upward and to the right is most pleasing, and such curves are common throughout the Lepidoptera. Approaching this in its capacity for stimulating pleasure is a gradual curve downward to the right. Following this are curves upward to the left and downward to the left. Referring to *Tropaea luna* again, all four of these curves are present in this moth and strikingly outlined.

Coming to bilateral symmetry, the aesthetic value of this depends upon the method of orientation and exploitation. With the Lepidoptera the eyes usually select a middle part and then make equal movements to the right and left. This is the natural method and in conformity with the relations of the eyes with their muscles.

Practically all collectors of insects start with the Lepidoptera for the simple reason that this order appeals to their aesthetic taste. This taste of course can be trained and the mental qualities along entomological lines so developed that the level of aesthetic appreciation is raised and as a result the perceptions of members of other orders of insects give rise to pleasurable feelings and enjoyment. Interest and ownership of course do not enter into aesthetic appreciation. If you enjoy your collection of Coleoptera or Lepidoptera because it is yours, you are not having an aesthetic experience. Aesthetic pleasure is an entirely disinterested operation.

The Lepidoptera on account of their form will always stand first in the order of aesthetic value and the arrangement of the other orders will vary of course with different individuals.

A Course in Applied Entomology.

The Ohio State University has established a course in Applied Entomology and announces a course of study, leading to a Bachelor of Science degree, to cover four years of under-graduate work, including such subjects as Modern Languages, Chemistry, Botany, Zoology, Geology, Horticulture and Agronomy besides a number of strictly technical Entomological courses. It is intended to fit students for technical work in the Bureau of Entomology, Experiment Stations, State and Federal Quarantine Service or as Investigators in Boards of Health or other professional positions.

Plates of Diptera and Hymenoptera.

There are at the disposal of the Bureau of Entomology, Washington, D. C., a considerable number of sets of extra plates struck from the original engravings made for the Loew-Osten Sacken Dolichopodidae, Vol. II and Ortalidae and Trypetidae, Vol. III; also plates of Saussure's American Vespidae, originally printed in the Smithsonian Miscellaneous Collections, No. 254. The latter are uncolored. To persons interested in the two orders these plates will be distributed free of charge, upon application to the Bureau of Entomology.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., DECEMBER, 1913.

The Annual Entomological Meetings.

Elsewhere in this number are printed announcements of the meetings of the Entomological Societies to be held in Atlanta, Georgia, during the Christmas holidays, in conjunction with the meeting of the American Association for the Advancement of Science. The attendance in general at Atlanta will not be as great as that at Cleveland last year, owing to the fact that a number of societies of zoological and other interests will meet in Philadelphia. The separation is, to our mind, regrettable, but the best that can be done under the circumstances is to make the entomological program in the Southern City as important and valuable as possible. The good effect is to be sought for not only in the minds of those already working in entomology, but also in kindling a love for and an active interest in the intellectual and practical worth and usefulness of our science in those who as yet do not possess them. We want Georgia and the adjoining States to have their opportunity as well as Ohio and Pennsylvania.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

The Lepidopterous Caterpillar in the Bromeliad from Costa Rica.

In the list of bromeliadicolous insects from Juan Viñas, Costa Rica, published in the NEWS for November, 1911 (Vol. XXII, p. 405), was a Lepidopterous larva which Dr. Dyar said was an Hepialid. I had certain reasons of my own for doubting this determination, but not being a lepidopterist, and knowing that Dr. Dyar is keen on larval characters, I was bound to accept it.

Now Dr. Dyar has received his first authentic larva of a *Castnia* and has told me that he can find no characters to distinguish larvæ of Hepialidæ and Castniidæ. This has caused me to discuss this larva from the bromeliad with him and he now agrees that it is in all probability *Castnia*. Neither of us could think of records of Hepialidæ from monocotyledonous plants, while the Castniidæ seem to affect just these plants. *Castnia lycus* is a pest on sugar cane and other species are recorded from Bromeliaceæ (see Stichel, H., Berl. Ent. Zeitschr., Vol. 53, 1908, pp. 207-208, and Kirby, W. F., Handb. Lepid., Vol. 3, 1897, p. 35).

Since writing the above I have looked up the larval habits of the Hepialidæ and find that they attack cryptogamous (ferns) as well as phænogamous plants and among these latter several monocotyledons are recorded. Hoffmann states that the larvæ of *Hepialus lupulinus* L. feed upon the roots of *Triticum vulgare* (wheat) and *Triticum repens* (Raupen der Schmetterlinge Europas, 1893, p. 48); Meyrick records the same species from several dicotyledons and also the monocotyledon *Narcissus* (Handbook of British Lepidoptera, 1895, p. 800). As far as known the European and American Hepialidæ are all root feeders, but in Australia a number of species are known to bore in the stems of plants and the solid wood of trees.—FREDERICK KNAB, U. S. National Museum, Washington, D. C.

A Sealed Paper Carton to Protect Cereals from Insect Attack.

The United States Department of Agriculture has just issued a bulletin (No. 15) in which a sealed cardboard container for cereals is described, which should do much to protect cereals from insect attack.

The economic importance of such a container for cereals which the grocer sells by the box is greater than at first appears. Packages may become infested while in the grocer's storeroom or on his

shelves. Warehouses are also usually more or less infested by insects which crawl around on the packages. When such packages are purchased the buyer, on discovering that they have been attacked, usually returns them to the grocer; the grocer returns them to the mill where they were prepared and the mill screens the cereal and sells it as feed. The exact financial loss due to these conditions can not be accurately determined, but extensive observations lead to the belief that it is much greater than most millers suppose.

The new bulletin, which is a contribution from the Bureau of Entomology, gives photographs of the insects which attack stored cereal products. It gives the results of experiments in California with packages that were regularly closed by gluing the ends, and with those which were covered by a piece of label paper so that an insect could not enter without piercing the label. The result of this experiment showed that the non-labeled packages were thoroughly infested by insects, while the labeled packages were absolutely free from insects.

Besides the sealed carton, of which a diagram is given, other forms of packages which have been suggested for keeping out the insects are described. The bulletin may be had on application to the Division of Publications, United States Department of Agriculture.

Announcement of the Eighth Annual Meeting of the Entomological Society of America.

The eighth annual meeting of the Entomological Society of America will be held in Atlanta, Georgia, Tuesday and Wednesday, December 30 and 31, in affiliation with the meetings of the American Association for the Advancement of Science and other affiliated societies. Meetings will be held Tuesday forenoon and afternoon, beginning at 9.00 A. M., and on Wednesday forenoon. The meetings of the American Association of Economic Entomologists will begin Wednesday afternoon with other meetings on Thursday and Friday.

The by-laws provide that there shall be held at the annual meeting a technical exhibit of entomological materials and methods. Any photographs, drawings, specimens, novelties, apparatus, or other matter of interest to entomologists which you may wish to exhibit will be heartily welcomed. This exhibit will remain open during the entire period of the meeting, for the examination at their leisure, of those interested.

The annual business meeting will be held Wednesday morning, December 31st, for the reports of the executive committee, the treasurer, the editor of the *Annals*, the auditing committee, the election of new members, and the transaction of all other business.

The Annual Public Address will be given on Wednesday evening,

December 31st, by Dr. E. P. Felt, State Entomologist of New York. His subject will be "Gall Insects."

It is impossible to give any information at this date as to whether reduced fares will be available to Atlanta or not. Practically all ticket agents are provided with tariff regulations and can tell whether convention rates are available or not. If the certificate form of ticket is used the following should be noted:

1. Tickets at full fair for the GOING journey may be secured within three days (exclusive of Sunday) prior to and during the first three days of the meeting. The advertised dates of the meeting, A. A. A. S., are December 29, 1913, to January 3, 1914.

2. Present yourself at the railroad station for ticket and certificate at least thirty minutes before departure of the train.

3. Certificates are not kept at all stations. If you inquire at your station you will find out whether certificates and through tickets can be obtained to the place of meeting. If not obtainable at your home station, the agent will inform you at what station they can be obtained. You can in such case purchase a local ticket thither, and there purchase through ticket and secure certificate to place of meeting. Be sure that when purchasing your going ticket, you request a *certificate*. *Do not make the mistake of asking for a receipt.*

A fee of 25 cents will be charged at the meeting for validating certificates. No refund of fare will be made on account of failure to have certificate validated.

A smoker will be held on one of the evenings during the week of the meeting of the A. A. A. S. The date will be announced later.

The hotel arrangements enjoyed by members of the American Association will be accorded to the members of this society. The same hotel will be used for headquarters as that used by the American Association of Economic Entomologists and will be announced later.

ALEX. D. MACGILLIVRAY, *Secretary-Treasurer*.

CHARLES J. S. BETHUNE, *President*.

The Twenty-sixth Annual Meeting of the American Association of Economic Entomologists.

The 26th Annual Meeting of the American Association of Economic Entomologists will be held at Atlanta, Ga., on December 31, 1913, to January 2, 1914. At the last annual meeting of this Association a plan was adopted for holding a meeting of this Association and meetings of the sections on Horticultural Inspection and Apiary Inspection. At that time it was arranged that the Vice-Presidents of the Association should preside over these sections and each section elect a secretary, who will record the proceedings at the sectional meeting. It is proposed to hold a general meeting of this Association on De-

ember 31, 1913, at 1.30 P. M., at which time the general business of the Association will be transacted and the annual address of the President will be presented. Meetings on the following day will be devoted to the reading of papers before the Association and to sectional meetings, and care will be taken to arrange the program, so that members, attending the sectional meetings, will be able to hear such papers at the general meeting as may be of special interest to them. The meeting of the section on Horticultural Inspection will be in charge of Prof. E. L. Worsham, Atlanta, Ga., and the Secretary of this section is Prof. J. G. Sanders, Madison, Wis. Prof. Wilmon Newell will preside over the section on Apiary Inspection, and the Secretary of this section is Dr. E. F. Phillips, Washington, D. C. The general arrangement of other sessions of the Association at this meeting cannot be decided upon until the titles of papers have been received.

In accordance with our usual custom, the time allowed for presenting a paper should not exceed 15 minutes. In cases where the subject may be of particular interest to all members, this time may be extended, provided it will not result in overcrowding the program. A considerable number of members have already signified their intention of being present at Atlanta, and a meeting of unusual interest is anticipated.

PROF. P. J. PARROTT, *President*, Geneva, New York.

A. F. BURGESS, *Secretary*, Melrose Highlands, Mass.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in Heavy-Faced Type refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues of the *News*, which are generally dated the year previous.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

2—Transactions, American Entomological Society, Philadelphia.
3—American Naturalist. 4—The Canadian Entomologist. 5—
Psyche. 6—The Entomologist's Monthly Magazine, London. 9—

The Entomologist, London. 10—Nature, London. 11—Annals and Magazine of Natural History, London. 18—Ottawa Naturalist. 21—The Entomologist's Record, London. 22—Zoologischer Anzeiger, Leipzig. 23—Archives d'Anatomie Microscopique, Paris. 35—Annales, Societe Entomologique de Belgique. 37—Le Naturaliste Canadien, Quebec. 44—Verhandlungen, K. k. zoologisch-botanischen Gesellschaft in Wien. 50—Proceedings of the U. S. National Museum. 68—Science, New York. 72—Archives, Zoologie Experimentale et Generale, Paris. 75—Annual Report, Entomological Society of Ontario, Toronto. 78—Gardners' Chronicle, London. 79—La Nature, Paris. 84—Entomologische Rundschau. 86—Annales, Societe Entomologique de France, Paris. 87—Bulletin, Societe Entomologique de France, Paris. 89—Zoologische Jahrbucher, Jena. 92—Zeitschrift fur wissenschaftliche insektenbiologie. 119—Archiv fur Naturgeschichte, Berlin. 131—Proceedings, South London Entomological and Natural History Society. 153—Bulletin, American Museum of Natural History, New York. 168—Internationale Entomologische Zeitschrift, Guben. 169—"Redia," R. Stazione di entomologia Agraria in Firenze. 173—Die Grossschmetterlinge der Erde, Fauna Americana, von A. Seitz, Stuttgart. 176—Archiv fur entwicklungsmechanik der Organismen, Leipzig. 177—Quarterly Journal of Microscopical Science, London. 179—Journal of Economic Entomology. 186—Journal of Economic Biology, London. 195—Bulletin, Museum of Comparative Zoology at Harvard College, Cambridge, Mass. 198—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. 201—Memoires, Societe Entomologique de Belgique. 216—Entomologische Zeitschrift, Frankfurt a. Main. 217—Bulletin, Societe Entomologique d'Egypte. 218—Mikrokosmos. Zeitschrift fur die praktische Betatigung aller Naturfreunde, Stuttgart. 220—New Jersey Agricultural Experiment Station, New Brunswick. 278—Annales, Societe Zoologique Suisse et du Museum d'Histoire de Geneve, Revue Suisse de Zoologie. 279—Jenaische Zeitschrift fur Naturwissenschaft. 285—Nature-Study Review, Ithaca, N. Y. 311—La Science au XXe Siecle, Paris. 322—Journal of Morphology, Philadelphia. 324—Journal of Animal Behavior, Cambridge, Mass. 336—Board of Agriculture, Trinidad. 344—U. S. Department of Agriculture, Washington, D. C. 355—Smithsonian Institution Report, Washington, D. C. 359—Connecticut Agricultural Experiment Station, New Haven. 368—The Monthly Bulletin of the State Commission of Horticulture, Sacramento, Cal. 394—Parasitology, Cambridge, England. 399—Proceedings of the Cambridge Philosophical Society, Cambridge, England. 411—Bulletin of the Brooklyn Entomological Society. 418—The Philippine Agricultural Review, Manila. 420—

Insecutor Inscitiae Menstruus: A monthly journal of entomology, Washington, D. C. 437—*Sitzungsberichte und Abhandlungen der Naturforschenden Gesellschaft zu Rostock*. 440—*Nouvelles Archives du Museum d'Histoire Naturelle*, Paris. 441—University of Wyoming Agricultural Experimental Station, Laramie. 442—*Transactions of the Connecticut Academy of Arts and Sciences*, New Haven. 443—*Unsere Welt*, Bonn. 444—Minnesota Farmer's Library, University Farm, St. Paul. 445—*Trabajos del Laboratorio de investigaciones Biologicas de la Universidad de Madrid*. 446—*Transactions of the Texas Academy of Sciences*, Austin. 447—*Journal of Agricultural Research*, Washington. 448—*Verhandlungen der Physikalisch-Medicinischen Gesellschaft zu Wurzburg*. 449—British Museum (Natural History) Publications, London. 450—*Apuntes de Historia Natural*, Buenos Aires.

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Doings of Societies.

ENTOMOLOGICAL SECTION, ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

Meeting of May 22nd, 1913. In the absence of the Director and the Vice-Director, Mr. E. T. Cresson presided; seven persons present. Dr. Calvert stated that in 1896 Messrs. Laurent and Castle, published in *Entomological News*, a list of insects collected in Florida, and among the Odonata was one identified by the speaker as *Nehalennia irene*. Later, he came to the conclusion that it was not *irene*, being structurally different. Since then other specimens from Florida

have been examined, also a specimen from Malaga, New Jersey, taken by Mr. E. Daecke. It appeared as *Nehalennia integricollis*, a *nomen nudum*, in the New Jersey List of 1910. The female of the new species is more nearly related to the European *speciosa*, in the same genus than to any of the American species. The differences between the species were pointed out and illustrated by sketches.

A letter was read from Mr. Nathan Banks requesting the Section to appoint two persons to represent it on the Nomenclature Committee of the International Entomological Congress. Mr. J. A. G. Rehn and Mr. E. T. Cresson, Jr., were elected to act in this capacity.

Mr. John Enburg was elected an Associate of the Section.

Meeting of September 25th, 1913. Mr. H. W. Wenzel, Vice-Director, in the chair; twelve persons present. Mr. J. R. Malloch spoke of his impressions of this country entomologically. He said many species of insects, particularly Diptera, supposed to be common to this country and Europe, were often found to be different species, and dwelt on the care necessary to determine these points accurately. He mentioned the exceedingly wide distribution of certain species of Diptera and compared the work of himself and another entomologist working on the same group and said their work was quite dissimilar. He mentioned the numerous local lists published in England and the many local societies there.

Dr. Calvert referred to Hagen's figure in the *Zoologischer Anzeiger* for 1889 of an Odonate wing (*Epiaeschna heros*) split into its two laminae and exhibited a similar preparation of a wing of *Libellula luctuosa* Burm. mounted as a lantern slide. The wing of a teneral specimen was cut off close to the body and the two laminae separated at the base of the large veins enough to admit of the entrance of the nozzle of a pipette. The wing was then immersed in water and water forced in between the laminae by the pipette until the laminae were completely separated and the wing resembled a sack or bag. The laminae were then cut apart along their

edges, first along the hind margin and then along the front margin. This cutting may be done with a pair of scissors, a scalpel or even with the nozzle of the pipette. When the laminae are almost, or entirely, separated they are floated on to a glass plate, as in mounting sea-weeds, and dried covered with another plate.

He also read from a recent paper of Bervoets (Ann. Soc. Ent. Belg. July 4, 1913) who has shown that the wings of insects are not dry dead organs, but contain circulating blood and are living and sensitive.

Mr. Rehn exhibited Orthoptera of the genera *Dichopetala*, *Insara* and *Arethaea* belonging to the Hebard collection. It is the most extensive series of these forms known. All the known forms of these katydids had been examined and nearly all were represented in the collection shown.

Dr. Skinner referred to some collecting he had done during the month of August, 1913, in the White Mountains of New Hampshire. August the 20th he made the ascent of Mt. Washington in search of *Argynnis montinus* and captured seven specimens. The first one was taken at timber-line near the Half-way House on the carriage road from the Glen House. The remainder were found on the road between the 4th and 5th mile-posts and none were seen beyond the latter point. The species was rather wary and those taken were resting on golden-rod or sunning themselves in the dust of the road. A number of specimens of *Somatochlora elongata* were taken around a small pond near the Jackson Falls house. Insects were scarce on account of the prolonged drought. A number of species of moths were taken at electric lights.

Mr. Hornig reported the salt-marsh mosquito, *Aedes sollicitans*, as breeding in large numbers at the salt works at Weccacoe Avenue and Swanson Street, Philadelphia. These mosquitoes were annoying at the Navy Yard and existed by thousands. He described the general condition of the locality. He also reported finding 406 Dipterous larvæ in two cubic inches of pig excrement from the piggeries in South Philadelphia.

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Mr. Wenzel spoke of a new way of collecting insects devised by Mr. H. S. Barber, of Washington, D. C. He used shot cartridges in a revolver and shot through a tube four feet long. Insects like the Cicada, high up in trees, were readily obtained by this device.

Mr. Charles W. Frost was elected an Associate of the Section.—HENRY SKINNER, *Recorder*.

OBITUARY.

DEPARTMENT OF ENTOMOLOGY, CORNELL UNIVERSITY

Ithaca, N. Y., October 23, 1913.

The members of the Jugatae have learned with deep sorrow of the death of our former president, associate and friend, ALFRED G. HAMMAR.

Mr. Hammar was for six years an active and enthusiastic member of our entomological group. His broad conception of his work and his high ideals were an inspiration to all who came in contact with him. In his death the scientific world has lost one who would have taken a prominent part in the development of his chosen field.

But while we realize the loss to science, it is especially our personal loss of a friend, dear to each of us, which is foremost in our thoughts. To his bereaved family we extend our deepest sympathy.

J. H. COMSTOCK,
J. CHESTER BRADLEY,
WM. A. RILEY,
Committee.

ALFRED RUSSEL WALLACE.

Alfred Russel Wallace died November 7, 1913. We shall make some reference to his entomological work in our January number.

ERRATA. On page 357, line 26, for "his series under *erica*," read "his series under *characta*."

Page 416, line 26, for "Saint-Etienne," read "Commentry."

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